Seaward Development

CASE STUDIES OF CITIZEN PARTICIPATION

ACADEMY FORUM

NATIONAL ACADEMY OF SCIENCES

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National Academy of Sciences
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FOREWORD

Robert R. White
Director, Academy Forum

Nowhere in the range of topics undertaken by the Academy Forum over the past eight years do the stresses and intricacies of national needs versus regional interests stand out so clearly as in "Seaward Development: Case Studies of Citizen Participation." Meeting over a period of two and a half days in January 1979, the discussions reported here and recorded from workshops and plenary sessions cover a wide array of fact and opinion.

The four actual cases analyzed in the Forum are the basis on which its theories rest and from which its conclusions are taken. They were chosen to illustrate the complexity of issues related to seaward development, with particular emphasis in each given to the role of citizen participation.

To further explore and understand some of the regional interests and differences that appeared during the Forum, conferences were held in the summer and autumn of 1979 at the following locations: University of California, Los Angeles; the Center for Wetland Resources, Louisiana State University; and the Center for Ocean Management, University of Rhode Island. Summaries are available from the Forum office.

Every effort is made toward seeking sources of funding for each Academy Forum that are as diversified as its participants, audience, and viewpoints. We wish to acknowledge the following support for the development and publication of the Academy Forum on seaward development as well as the regional conferences emanating from it:

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Global Marine, Inc.
Shell Oil Company
Sun Company, Inc.
Union Oil Company of California
Zapata Corporation

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PERSPECTIVES

WELCOME

Robert R. White
Director
Academy Forum

The Academy Forums seek to identify and to illuminate important national issues that involve science and technology. Our concept is to seek this illumination basically through dialogue between the audience and the experts we bring together as part of the resources of the Forum. Consistent with this spirit, the structure of the program seeks take-off points for discussion. It does not offer comprehensive lectures. We have even avoided asking our principals to prepare written material in advance, because we seek spontaneity.

Finally, we have tried to bring together people currently involved in problems of the real world, rather than those who might summarize all this complicated field in terms of analyses ex post facto to events. Also, consistent with the nature of the Forum, we have had the help of many people over many months in developing this subject. From the various staffs of the working groups of the National Research Council, I mention particularly Mary Hope Katsouros of the Ocean Policy Committee, William Robertson of the Commission on Natural Resources, and Richard Vetter of the Ocean Sciences Board.

I also would like to underline the large contribution we have had from Randolph King and Leonard Bassil of the Maritime Transportation Research Board. I might mention that a report of this group has just been published, Public Involvement in Maritime Facility Development. One of your speakers, Oliver Brooks, was the chairman of this effort. We were lucky enough to see the progressive drafts of this report as it was being developed, and it was a great help to us.

Finally, I want to pay a maximum tribute to the Marine Board of the Assembly of Engineering. They suggested this Forum. The staff officer, Jack Boller, has spent innumerable hours with us. His ways are sometimes redoubtable, frequently inspiring, and always helpful. He has steered us through many shoals with an unfailing touch, and we are very grateful to him.

One of the keys to a good Forum is to have imaginative, knowledgeable and sensible directors of traffic, and we have two of them. One of them is Alfred Keil, a staunch member of the National Academy of Engineering. The other is H. William Menard, who is a member of the National Academy of Sciences. So I can't resist saying that this good ship called an Academy Forum is just casting off the mooring lines of port. It is heading seaward on a collective voyage of what I hope will be development, and it is a great personal privilege for me to turn the helm over now to the first master of traffic, the steersman, Dr. H. William Menard.

INTRODUCTION

H. William Menard, Co-Chairman
Director
U. S. Geological Survey

All that nautical talk takes me back to my days as an apprentice ensign, just getting my bachelor's degree, and going off in 1942 to Harvard for the Navy's indoctrination school. There we were taught that when heading out to sea, the main thing to remember is Red Right Returning. So I hope we will all get back safely from this meeting.

My responsibilities are small. The first of these is to introduce myself. I am Bill Menard. I have been involved with matters of seaward development since about 1950. Before that I was involved with sea aggression.

Dr. White referred to people who are addressing problems of the real world. I was with the Navy Electronics Laboratory in the early fifties, and all during the years I spent as a marine geologist at the Scripps Institution of Oceanography, in the deep sea, the shallow sea, under the sea, on the sea, I think I can honestly say that I was involved with the problems of the real world.

In April of this last year I came to Washington and became Director of the Geological Survey, and I accept no responsibility for the real world after that.

I have a few other responsibilities in this Forum. One is to say that I am charged with keeping us to a fairly rigid schedule.

NATIONAL NEEDS, OPPORTUNITIES, AND CONSTRAINTS

John P. Craven
Dean of Marine Programs
University of Hawaii

I would like to begin by asking you to imagine New York City in the nineteenth century. Here was a society that was truly maritime and truly oceanic. It existed at a time in which we had cities with large populations that lived in a fairly high-density situation, but they were cities that were low-energy cities. They achieved this desirable state of affairs primarily because they used the ocean and the ocean environment.

Both mass transportation and the transportation of goods and services were by sea. Also, they were basically operated by solar energy, because the major transportation was with sail as the mode of power, which we all know is the future solar energy propulsion mechanism that we will be forced to go to at the time that our energy resources are gone. We should note also that the society utilized the water not only for mass transport of its people, but also for the disposal of its wastes.

In those days the East River, far from being empty of traffic as it is today, was filled with traffic of all sorts: sailboards carrying commerce and trade; paddlewheel steamers carrying tourists to enjoy the scenery of the city; and ferryboats, the most effective mass transit system we have ever seen for carrying people from one place to the other. Moreover, the area of Brooklyn that became a slum was then a promenade in which the people of Brooklyn lived in a park-like environment close to the shore and enjoyed the ocean scenery. The Hudson River was not only an artery for commerce and trade for New York City, but it connected with the Erie Canal and all the way to the Great Lakes. Therefore, it provided commerce and trade to the very center of the nation and for the whole of the continent.

If we examined the recreation of that period, we would discover that at that time Coney Island was an uncrowded, open, unpolluted beach where

many recreational activities took place; that Sheepshead Bay was an ideal spot to which people went to fish; and that basically the recreational activities of the people of New York City were either oceanic, riverine, or involved with Long Island Sound. All this allowed a society that was both low-energy-consuming and at the same time densely populated.

Then came the turn of the century, the invention of the motor car and the motor vehicle. With it came the notion that energy was free and the development of oil and gasoline, which were viewed as so low cost as to be essentially trivial.

So New York City, as well as the rest of our cities, moved into the automotive society. I refer to this locality because it is reminiscent of my own youth in Brooklyn and the problem that we had when the automobile came and displaced the street baseball game. No longer could one play on the streets of the city, because the new mode of transportation occupied every square foot of the city. The automobile that came in first as a freedom from logistics became a constraint on logistics. So today it is far more time-consuming to cross the East River or the Hudson River than it was in the nineteenth century. The volume of goods that could be moved across these areas is less now than it was then because of the impaction of the automotive vehicle with the bridge.

We have come to a time when the energy dollar is no longer free; indeed, the cost of energy is now becoming a substantial, if not the major, element in our economy. So we look to the future when we must return to low-energy societies if we are to be successful in solving our economic as well as our environmental problems. Can we replicate the good aspects of the past century in a modern, low-energy society with the help of modern technology and the utilization of the ocean community? Can we as a nation turn to the ocean and to the rivers again as a solution for our major economic and environmental problems?

We at the University of Hawaii, where life is still oceanic and still uncluttered, examined this question by looking at New York City, where life is, we feel, most impacted and most cluttered, and the first question we asked ourselves was: Is it possible for the marine environment to provide a conduit for mass transportation that will move the people in volume and numbers -- and yet move them without impacting the society -- at low cost and in the environment? Figure 1 will show how we plotted quarter-mile and half-mile walking distances to the water environment which can be used for mass transit systems. We discovered that a large part of the city of New York can be covered by these kinds of transportation systems.

Indeed, we looked at many cities. In addition to New York, we considered Seattle, Honolulu, Boston, Philadelphia, Chicago, San Fancisco, Cleveland, and Washington. We found that in all these cities a very substantial portion of the population lives within one-half-mile walking distance of a marine conduit which could be used for mass transportation systems. As Figure 2 shows, in the case of New Orleans, this is almost 50 percent of the population; almost 40 percent of the

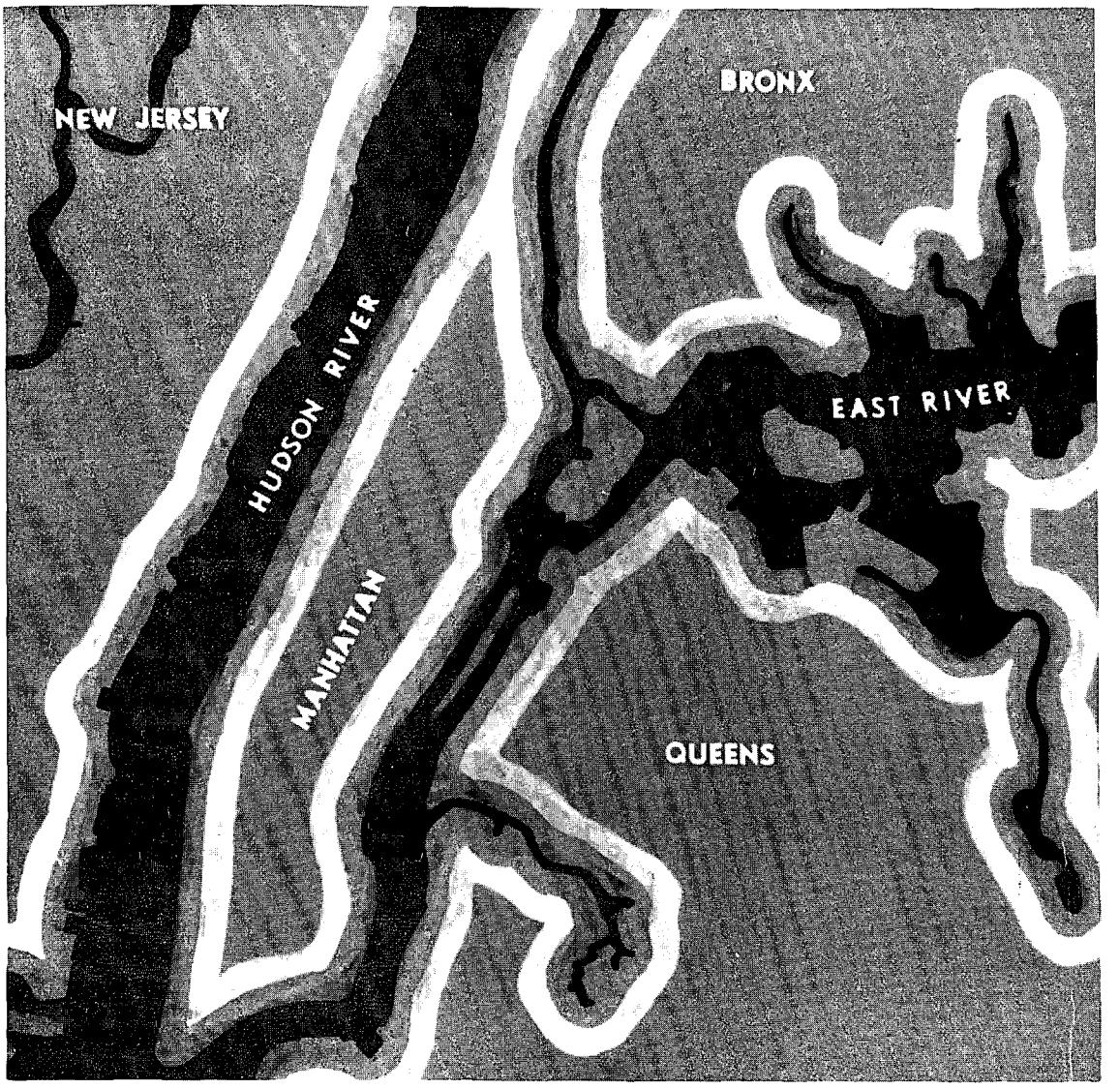

FIGURE 1. Accessibility of New York to waterways useable for marine mass transit (1/4 and 1/2-mile swaths).

population of New York; almost 35 percent of the population of Boston, and so on. Even in Washington, D. C., which we do not regard as a maritime society, more than 10 percent of the population lives within a half-mile of a conduit that could be used for marine mass transportation. And if you look at the fixed guideway population densities, you will discover that only New York City has a population density which is great enough so that the fixed guideways, the subway systems, have a higher accessibility in terms of people than do the water courses that naturally exist.

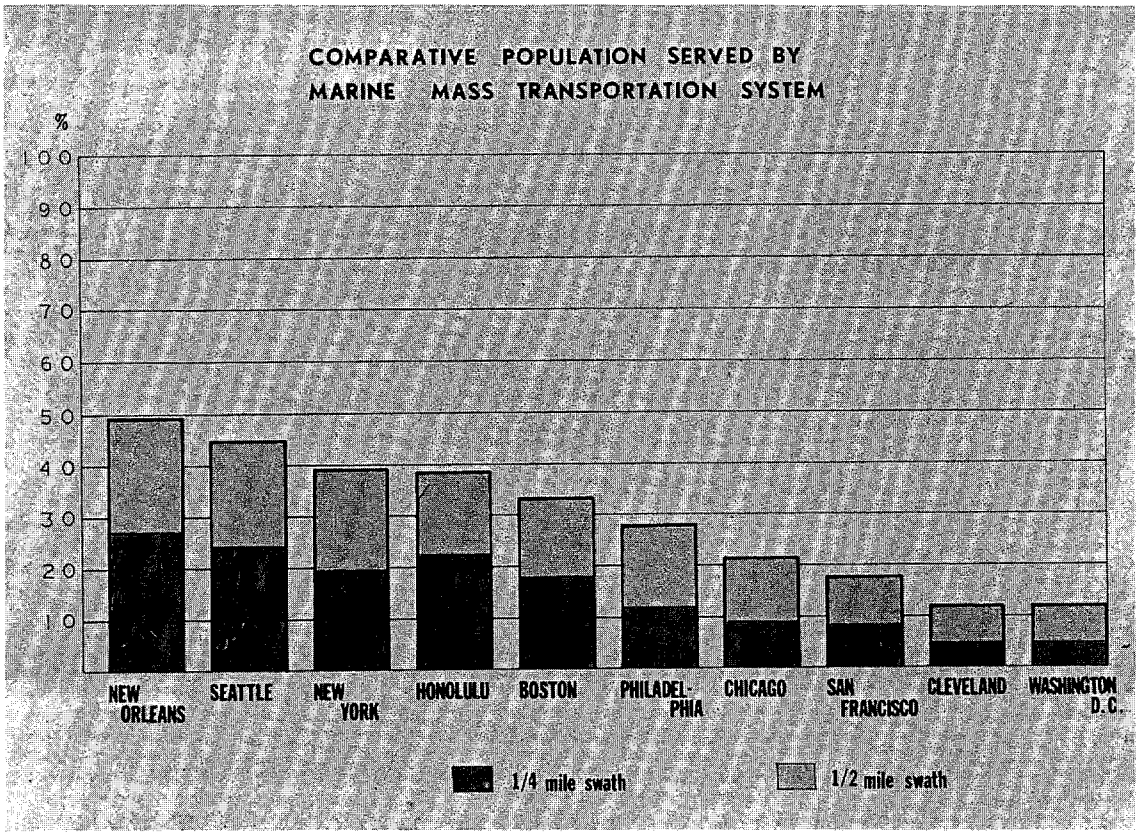

FIGURE 2. Comparative population served by marine mass transportation system (1/4 and 1/2-mile swaths).

Our next question was: Do the vehicles exist that can operate not only on these water courses, but on the oceanic environment? The answer to this question again is in the affirmative. The most exciting new vehicle on the horizon is one involving the semisubmerged platform. This is a vehicle essentially consisting of two submarine hulls below the surface of the water, thick structures that pierce the water, and a platform above. Always smooth even in the roughest seas, this idea was in fact developed by the United States Navy and appears in a ship called the Kaimalino. It is a great disappointment that it appears in a civilian version in Japan rather than in the United States. Mitsui's Sea Ace is a pre-prototype model of a ferry based on the semisubmerged principle.

Figure 3 shows Mitsui's SSP 434-passenger ferry, which will be in service this summer in Tokyo Bay and is a precursor of a whole series of passenger and roll-on/roll-off ferries that will provide a service between the islands and around the bays in Japan. A new type of craft, it is environmentally sound, is speedy, carries large numbers of people, and makes no one seasick.

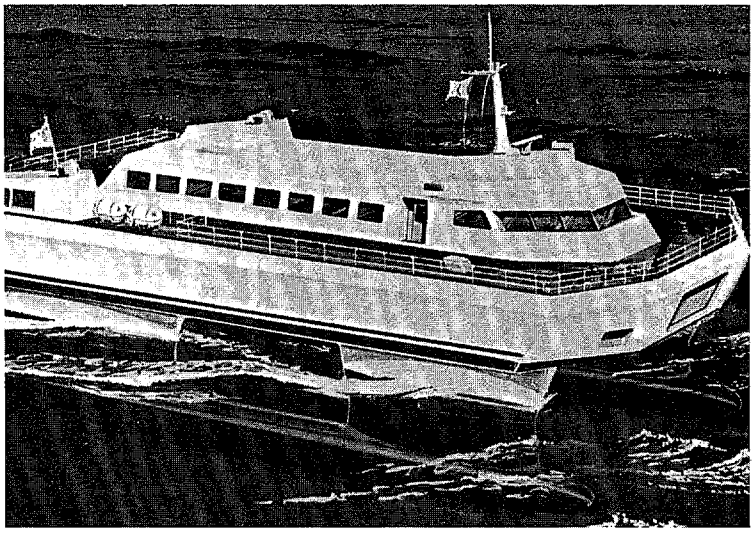

FIGURE 3. Semisubmersible passenger ferry, Mitsui Engineering & Shipbuilding Co., Ltd.

Another craft, the Boeing hydrofoil, has been developed here in the United States. Paradoxically, it has been an economic failure here even though it has been a financial bonanza overseas. It is a highly stable craft that can operate in very heavy seas. It is a so-called incidence-controlled hydrofoil, meaning that it compensates for the waves as they come ahead. The Soviet Union has a hydrofoil called the Raketa (Rocket); more than 700 such hydrofoils operate in marine mass transit on Russian rivers and waterways, as contrasted to the zero hydrofoil craft that operate here in the United States.

If we go to marine mass transit systems in the society, will they travel only in the areas of cities or will they find new places and new uses? Overseas we discover they will find new ways to go. The first of these are the artificial peninsulas that are being created. One is the Kuree Seaberth in Japan; there are other Japanese seaberths in which artificial peninsulas have been built in the bays and harbors to service the sea-based society.

Beyond that is the artificial island. A major artificial island will soon be built off the coast of Rotterdam. It will serve the European community as an extension of that developing maritime society.

In addition to artificial islands and peninsulas, these crafts will service floating platforms. One such structure is the semisubmersible platform. Although it has been developed by and primarily used in the oil industry, its stability and cost would enable many of the functions of society to be located on it in a convenient way, and it can be serviced by these marine transportation systems.

Indeed, this semisubmersible concept has been carried beyond steel structures into the prestress reinforced structures that are being used in the North Sea, the so-called Condeep structures, which consist basically of structures well below the surface of the water, with thin columns going through the water and platforms on the top. Figure 4

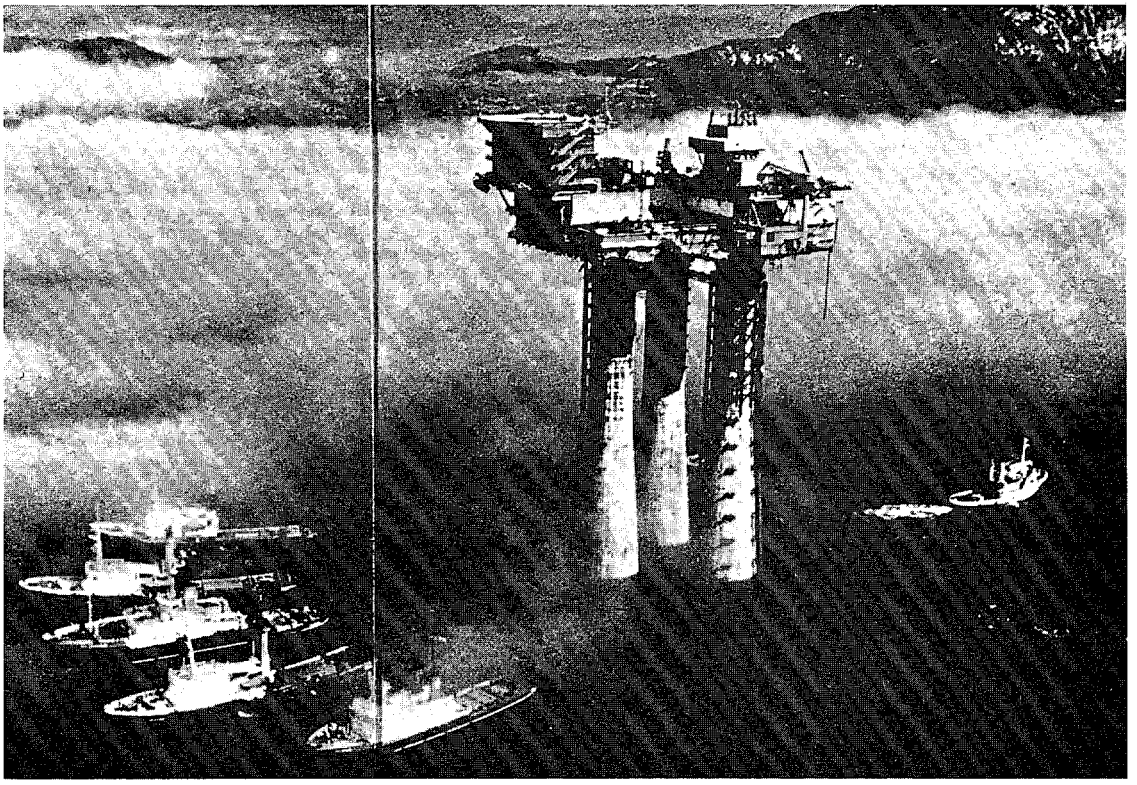

FIGURE 4. Condeep, prestressed concrete floating structure being towed to sea.

shows one of these structures being towed out in the North Sea. This demonstrates the technological capability of large-volume structures built at low cost being located in the ocean environment. The significance of this picture is that the major part of this structure is below the water. It is aestheticlly beautiful because you cannot see it. The minor part of the structure is the columns that pierce the ocean surface. The rather unattractive platform that exists on top can in the future be replaced by architecturally aesthetic platforms on the free surface which house many of the functions of a modern society.

Given the existence of low-cost platforms that are so stable that nobody gets seasick and that things aren't expensive to put aboard, what kinds of functions can we place at sea in our modern oceanic society? The first thing that we think about is industrial plants and processing plants. A barge has been built in Japan that contains a paper mill, shown in Figure 5. It was constructed in a Japanese shipyard and towed all the way to the Amazon in Brazil. It even has its own power plant.

The technological capability is now available for building industrial facilities -- power plants, paper mills, steel mills, and other things -- in an oceanic configuration, so that they can be located at sea, in close proximity to the land society but far enough away so that they do

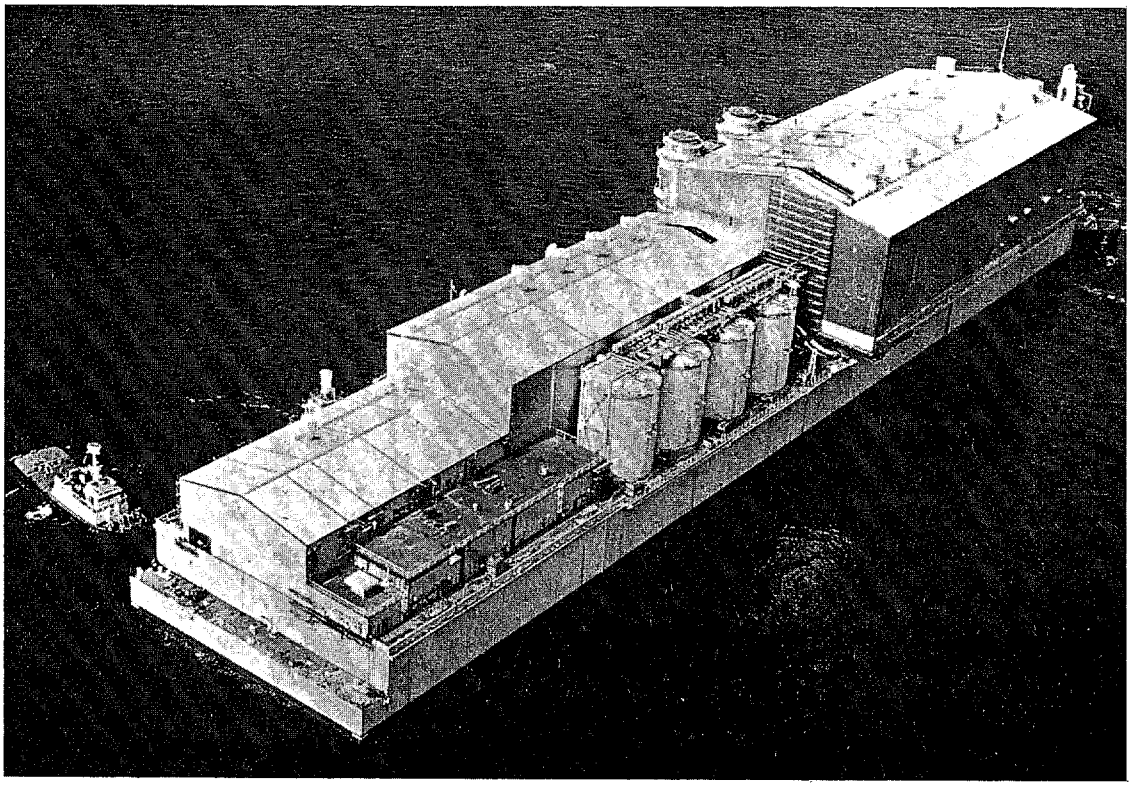

FIGURE 5. Floating paper mill, Mitsui Engineering & Shipbuilding Co., Ltd.

not pollute. People who live in the land society can go out and on a daily basis work in these factories and then return to the shoreline.

We ask how far this concept can go. It is important to point out that all such United States programs are still only artists' conceptions. Figure 6 is a U. S. artist's conception of a floating coal power plant, an approach to the provision of power for the Eastern Seaboard and the Western Seaboard that will allow us to build new power plants without polluting the land environment.

Unfortunately, we don't have the Westinghouse nuclear power plant as one of our examples. Westinghouse came up with the idea of placing nuclear power plants in a floating environment offshore and built a shipyard in Jacksonville to construct them, investing a large amount of money. Because of regulatory and economic factors in the U. S., New Jersey Power and Light defaulted on its contract and the plant has not been built.

There also is the possibility of ocean thermal energy plants, extracting energy from the oceans by utilizing the warm water of the surface and the cold water of the depths.

If we can locate the industrial functions of society at sea, in close proximity to the land, can we not also locate the urban, commercial, and

living functions of society on land, close to the sea? The answer to that, of course, is we can. This was demonstrated in the Hawaii Floating City Project, in which we laid out both the structural and the sociological aspects of floating platforms that place the high density core of the city just offshore, connected to the shore by marine mass transit systems, so that the land can be reserved for environmental purposes and for low density functions of the society.

This concept stirred a great deal of interest and amusement in the United States, and a great deal of interest and action in Japan. This action in Japan was represented at the Okinawa Fair by a platform called Aquapolis, or city of the sea. It was installed as a symbolic demonstration -- and symbolic only because they used an offshore oil platform instead of the appropriate design. The platform demonstrates how one would locate a high density core of a city in close proximity to the land, so that all of our highrises, instead of utilizing the land, could be located just offshore and out at sea, leaving the land reserved for museums and other public facilities.

The concept is developing that we can rebuild our cities with a high density core located at sea. But we must remember that there is more to that than living on the ocean; there are also recreational aspects. The

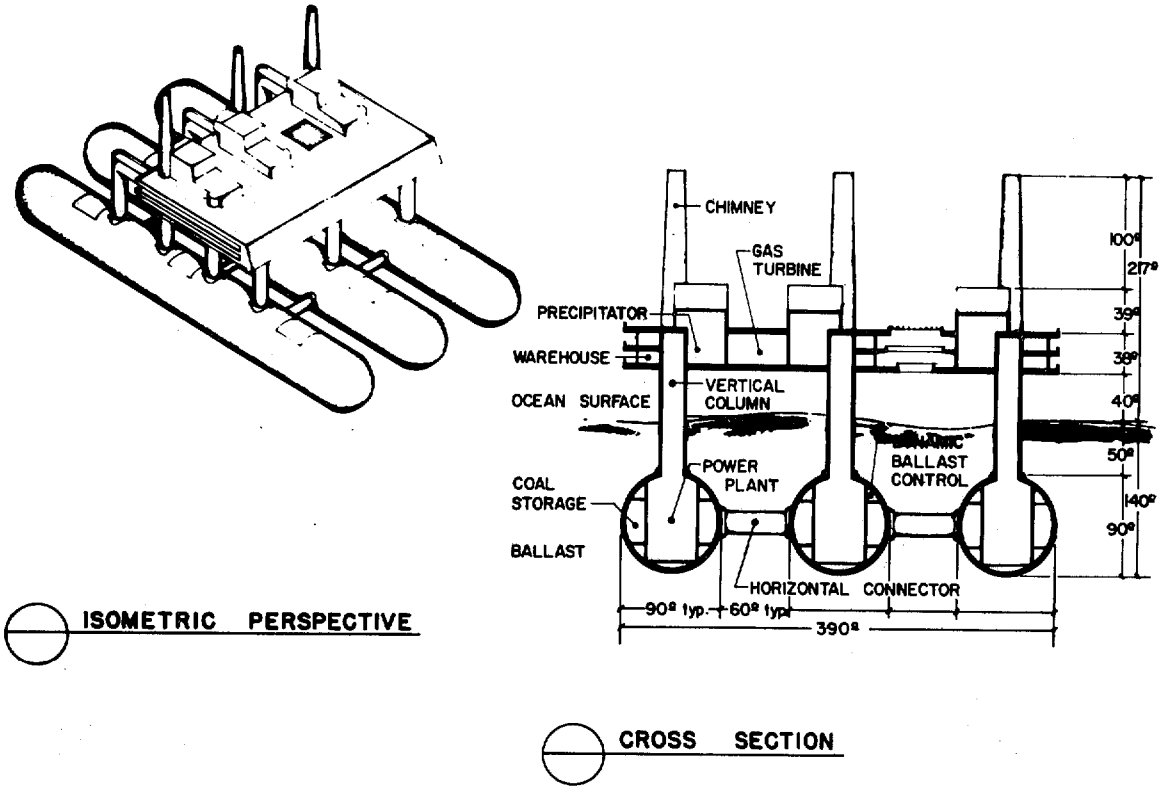

FIGURE 6. Floating coal-fired power plant, University of Hawaii design.

Japanese also are moving ahead in this direction. They have created an artificial beach in Okinawa that is remarkable for several reasons. First, it is a beautiful, white-sand beach. Second, it is still there despite a number of hurricanes and typhoons. Third, the coral reef, a beautiful one, has been left undisturbed. It would be virtually impossible to build this beach in the United States at the present time because of the environmental permits that would be required and the fact that there is no way of demonstrating that the installation of such a beach would not destroy the coral reef. Although this is a demonstration that that would not happen, it cannot be reduced to paper and is therefore nonprovable.

In addition, from the recreational standpoint, the Japanese have developed such structures as an underwater observatory so that the people of Japan may walk in safety and comfort down below and observe the reef and the fish life.

Finally, the University of Hawaii study has come up with a full demonstration of the movement of the city to the sea concept in the architect's model seen in Figure 7. This is our floating city model in which we locate the basic high density functions of the city at sea in a structure which is floating and which rotates, so that the people who live there will sometimes see sunrise and sometimes sunset; will sometimes see the land and sometimes the sea. And the people onshore at the same time will see a changing landscape.

The ultimate of this particular concept was demonstrated in a student's study of the west coast of Japan in which the valley configuration in which most societies live is reserved for golf courses,

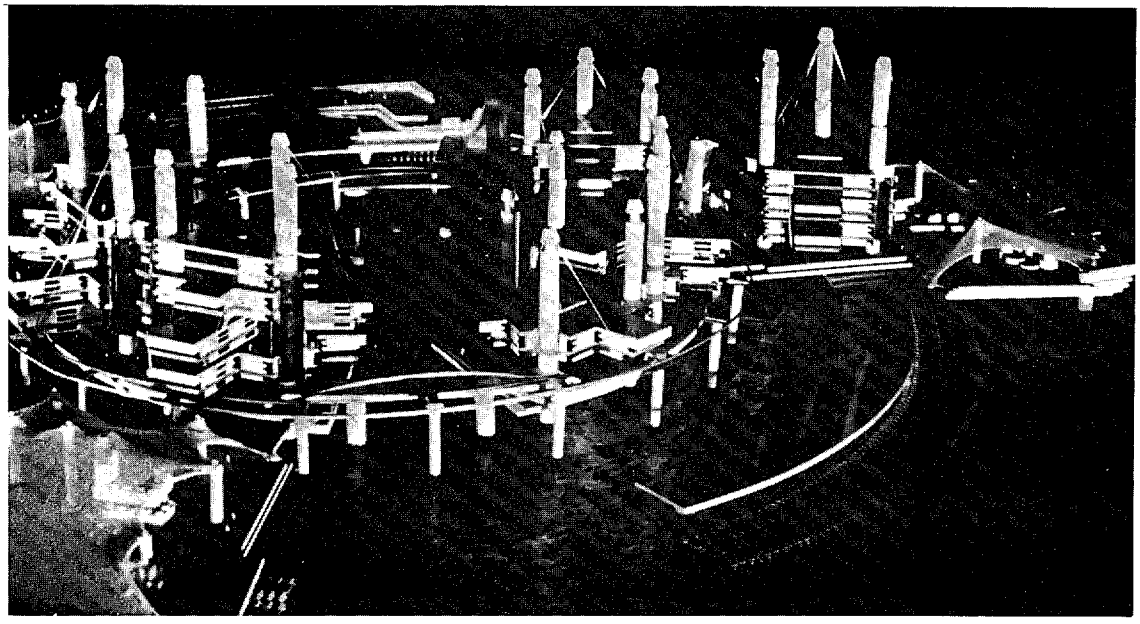

FIGURE 7. Floating city model, University of Hawaii.

for urban housing, for farm and agricultural land, for civic centers, and for football stadiums and other low density functions. The rivers that traverse these valleys are utilized for a marine mass transit, which extends out past the local coastline area to floating city complexes and industrial complexes, separated in such a way that they are mutually supportive but not environmentally interfering. Airports are located on islands offshore, so that the noise pollution from the aircraft is dissipated and so that the extensive land use that the airplanes require takes place where land is relatively free and available.

Why is it that we are neither prepared nor willing to restructure our coastal cities and coastal environment in terms of the ocean?

There are basically two attitudes in our society about the ocean. One is that the ocean is an environment that is fragile and needs to be protected. That attitude presents itself in a large section of our community which is resistant to any utilization of the ocean for any purpose whatsoever.

There is a second portion of our society that recognizes that the ocean is a place to be exploited, that it has mineral resources and industrial resources, and that it is a place in which the industrial processes of the society can take place at low cost with the economies of scale. That sector of our society is pushing very hard for ocean development.

There has resulted a polarization, which will prevent the effective utilization of the ocean until a new development takes place in our society. That development will occur with the recognition that the ocean is not only a place just as the land is a place, but that it is easier for man to blend with the ocean than the land. We must begin to think about all of our activities as being oceanic. We must think about oceanic poetry, we must think about oceanic art, we must think about oceanic music, we must think about oceanic law, we must think about oceanic architecture, we must think about all of the functions of society in an oceanic context as we thought about them in oceanic contexts in the nineteenth century. We must start to learn to live with the sea again. Very few of our people know what it means to live with, to live on, and to live around the ocean. It seems to me that we as a society are going to go down the primrose path of high-energy use until we can no longer afford it. At that point we are going to have to turn to low-energy solutions, such as living in harmony with the sea.

THE INDUSTRIAL ROLE

Michael R. Naess
President
Westminister Ventures, Inc.

I think it might be interesting for you to hear about two encounters I had on New Year's Eve at a private party in Munich, West Germany. Both of these stories, I believe, have a bearing on the business of this Forum.

First, there was the Bavarian chemist who had recently returned from his first long trip to the United States. He told me about how, on his first evening in the U.S., in his hotel room in New York, he was watching T.V. and happened to witness a beer commercial. This prompted him to try it out, and he called room service and ordered a bottle of American beer. Being a good Bavarian, he was, of course, somewhat surprised by the taste and consistency of this beer, and being a chemist, he was extremely curious, so he took a sample. He sent the sample back to his favorite testing laboratory in Germany. A few weeks later he had the result. The report read: "Dear Sir: We regret to advise you that your horse has diabetes."

The second encounter, somewhat later in the evening, occurred when I made the mistake of lamenting that in just one short week in Germany my living expense budget had virtually evaporated as a result of the continuing erosion of the dollar against the deutschmark. At this point a German of considerable arrogance -- mind you, that is not an anti-German comment, as my wife is German -- volunteered to tell me exactly what the problem was. By his unsolicited definition, the real reason for the strength of the mark against the dollar is that the West Germans have no redundant natural resources to speak of, and are therefore not conservation-oriented. "What little we have," he said, "we put to work as quickly as possible and get the most out of it. You Americans," he went on, and this is where he really got offensive, "think you have so much that you can afford to let your resources lie fallow while you engage in endless debate. Your mistake is that you

expect the international community to give you credit for your unrealized potential, whereas, in fact," he said, "what we pay for is current performance. Your only fully utilized resource is the capacity of your law schools, and we in Germany don't think that is worth very much."

What almost ruined my New Year's Eve was not the man's outrageous arrogance so much as the fact that he was at least partially right. In terms of the development of our ocean resources, we Americans seem somehow to be debating more than we are performing. If we could carve out a representative core sample of our total ocean effort and send it to a lab, we might in fact receive back a report something to the effect that the Ladies' Garden Club needs a change of venue.

Now, why am I selected to deal with the industrial role in seaward development? I must confess, I am not sure. Since September first I have been engaged primarily as a consultant to numerous energy-oriented and marine-oriented businesses. Prior to that time I spent the majority of my working career in various capacities with Zapata Corporation. My most recent function with Zapata was as Senior Executive Vice President and a member of the board of directors. As chief operating officer of its service group of companies, I oversaw a fleet of offshore drilling rigs, supply vessels, petroleum products tankers, dredges, and various units engaged in offshore construction. In addition, since 1977 I have had the honor of being a member of NACOA.

The complexity of this topic of mine depends on how I pronounce it. The industrial role, or the industrial role. Clearly, there is no one definitive role for industry in the oceans area. Equally clearly, there is no majority view among people in industry as to what the role or those roles should be. Like all the other participants in the oceans area, industry has a number of different roles it could and should play, so my approach to the problem is to discuss the industrial role in contrast to the roles of other elements.

The role of industry in the ocean area is mainly carried out by large public companies, or by smaller service companies necessarily functioning under contract to the big ones because of the amount of capital involved. This is, of course, not strictly true in certain segments of ocean activity such as the fishing business, which encompasses numerous privately owned small companies and partnerships. But with this exception and a few others, the business of ocean use can largely be characterized as one requiring unusually large chunks of capital and complex technology, with long lead times. For these reasons, it is the playground, if you will, of large companies.

An idealized view of what industry ought to be doing offshore, and I stress "idealized," is simply this: We should be free to go after the resources, we should be allowed to develop and market them at our pace and in our way, thus simultaneously providing a fair return to our shareholders and achieving a very necessary national objective. With that said, now to the real world.

As you all know, about ten years ago the conflict generally in resource development changed from being a relatively simple

industry-versus-government proceeding and turned, instead, into a sort of three-cornered battle. An oversimplified sketch of the situation today is a triangle, where industry is the protagonist; the public, whatever that means, is the antagonist; and the government sits somewhere in between. The function of the industry is to get the job done. The objective of the public is to block it in some cases, but more often to modify it in accordance with some social goals; and the function of government is to achieve compromise, presumably in the national interest.

The problem with this model, obviously, is that it seldom works that way. Government doesn't always demonstrate complete confidence in industry's ability to get the job done, and neither the public nor industry appear always to trust government's ability to act effectively as the architect and negotiator of compromise. The result is that there is a constant switching and commingling of roles. The triangle, if you will, constantly reorients itself. Government and industry insist on trying to do each other's jobs, which of course is what each of them is least equipped to do, or at least to do well. Industry fumbles around trying to act political, and -- just as bad -- government finds itself taking on technical, and even worse, commercial feasibility decisions.

But whoever happens to be the protagonist at any particular point in the proceedings is by definition the bad guy, since to have a developmental bias today, whether you are industry or government, is to be tainted and vulnerable. Increasingly, the burden of proof is more on the doer to show why than on the non-doer to show why not.

Now, what is wrong with that? Let me drop back to some fundamentals. As I understand it, the theory behind public participation is that the creation of the third element in the triangle improves, vastly, the probability of a balanced, fair result. This is simple bargaining theory, which holds that the best possible deal for everyone concerned, and the one most likely to endure, is achieved as a result of arm's length negotiations between unrelated, independent parties, each of which speaks with one voice and is of roughly equal strength.

The problem is that the entities in the seaward development process are, first, not unrelated to each other; second, not unified within and of themselves; and third, not of equal strength. The public elects most of the government and owns most of the industry. Government regulates industry in a myriad of different direct and indirect ways. Industry employs a good proportion of the public. With all these mutual interdependencies, how can the bargaining process ever be arm's length?

On the second point, only on rare occasions is any one of the three parties in a position to speak with a single, authoritative voice. Each accuses the other of creating delay and confusion through fragmentation and inconsistency of position, when in fact all three are highly fragmented.

Both industry and the public constantly bemoan the problems created by overlapping laws and conflicting jurisdictions. Given the role of the doer, industry would appear most likely to benefit from any reorganization of the federal government designed to reduce the problem

of multi-stop permitting but, paradoxically, industry is not at all unanimous that centralization of licensing authority is necessarily a desirable reform. With the power to say "yes" in one locus would come the power to say "no," perhaps with no right of appeal.

The problem of fragmentation within industry itself is one that deserves special attention here. Contrary to what Senator Kennedy and the Justice Department would have you believe, there is competition between and among large American corporations, and there are certain industries, in particular the marine transportation industry, within which one of the many problems is the proliferation of conflicting trade associations.

Finally -- as I believe the public so often fails to recognize -- there is the fact that every major corporate decision usually represents a trade-off between competing and conflicting internal considerations. The popular myth is that large industrial entities are action-oriented to the exclusion of any attention whatsoever to process. Generally, this is not true.

Let me list just a few of the internal conflicts that the process of corporate decision-making must attempt to accommodate. First, as I have already pointed out, investments offshore generally require large chunks of capital, and for most growth companies, capital is a scarce resource. Hence, each investment project must compete in terms of rate of return and strategic importance to the company with numerous other investment projects. The more unpredictable a given project's future may be, the higher the perceived risk, and therefore the higher must be the projected rate of return. The longer the lead time involved in a given project, the lower the present value of the income stream generated by that project at a constant discount factor. This does not mean that corporate management will necessarily confine its investments to short pay-out proposals, since profit maximization must be viewed as a long-term process. But it does mean that projects having long time horizons are subject to particularly careful scrutiny.

Quite apart from the process of allocating capital within a given budget, the process of defining the total funds available for internal investment also involves a number of delicate trade-offs for management. Competing for those same funds are the shareholders, many of whom want higher dividends; the lenders, who want to minimize their risk; customers, who want expanded services; employees, who want both growth and security; and vendors, who want payment in the shortest possible time. For most large corporations, furthermore, the shareholder group itself is far from homogeneous. There are the widows and orphans who want to maximize both the security of and the yield on their investment. There are the high bracket folks who want minimum yield and maximum capital appreciation. There may be political activists among the shareholder group who are less interested in the company's economic performance than they are in whether we are meeting certain social or political responsibilities. And although this is not often articulated, it is a fact that for any corporation an essential ingredient to long-run profit maximization is the perception by the public that its

behavior is socially responsible.

Finally, there is the conflict between what may be in the best interests of today's shareholder versus what may benefit the shareholder of tomorrow. The man who bought the stock five years ago at half of today's price clearly has different desires and different interests than the man who is in there buying it right now.

All of the above considerations have been part of the corporate decision-making process since long before the recent interest in public participation. Now, as you all well know, given recent initiatives from the SEC, all U.S. public companies today are under intense pressure to grant the public more participation in their internal affairs, all the way up to their respective board rooms. Audit committees composed of outside directors are now becoming as important as executive committees. The SEC has proposed new regulations that would require a majority of bona fide, outside directors on the full public company boards. The point is that for a long time, various segments of the public have already been participating in an important way in the corporate decision-making process.

I think I have dealt adequately with fragmentation within both government and industry, and with the resulting internal checks and balances within each. It is probably self-evident that the public is also highly fragmented, so fragmented, in fact, as to defy anything but a very broad definition.

Finally, in addition to being interrelated and fragmented, the parties to seaward development are clearly not of equal strength in what is essentially a political process. Industry is supposed to be the doer, but by nature and by law, industry enters the political process ill-equipped. Corporations are citizens but cannot vote and cannot make political contributions. They can make only limited use of their hire/fire and buy/sell power. They have the resources to finance PR programs designed to educate or persuade, but such expenditures may not be tax deductible. Their only weapons, in fact, are the personal financial resources of the officers and employees of the corporation, acting either directly or, more recently, through political action committees as well as the power of personal persuasion and reason.

We in industry must become more skilled in the use of these few devices. Top management can no longer afford to be introverted. Active and personal participation by chief executive officers in external political affairs is becoming an increasingly important determinant of corporate success. But for now, it is very definitely an uphill fight, and one that is very frustrating.

The single biggest problem is that for industry to comfortably commit massive amounts of capital, a key requirement is predictability. We must be able to plan with some reasonable degree of confidence. By definition, that which is primarily political is also largely unpredictable. For example, who would have predicted that by now, early in 1979, the total amount of money spent drilling for hydrocarbons in the Baltimore Canyon has yet to match even the interest cost to date on the signature bonuses paid at the original Lease Sale 40?

Every company in the ocean development industry has been burned, directly or indirectly, by the unpredictability of political conflict in the ocean program. At Zapata, unfortunately, we were no exception to this rule. For example, guided by the rhetoric of Project Independence and by the proposed leasing schedule which ensued therefrom, we committed $150 million to the construction of four new semisubmersible drilling rigs specifically designed for the East Coast. As it turned out, those rigs were delivered to us long before they could be utilized in the environment for which they were intended.

Additionally, on the strength of the program mandated by Congress in the Merchant Marine Act of 1970 and with the promise of further legislative initiatives, we sold a fleet of foreign flat tankers and built a U.S. flag fleet. Cargo equity passed the Congress with wide margins in 1974, only to be vetoed by the Administration. Three years later it reemerged, this time supported by the Administration, but it was defeated in the House by a wide margin. At some point in the process of an escalating political controversy, industry tells itself there has got to be a better way to make a buck. The energy area is a case in point. The major oil companies have long been a significant presence in the coal industry. More recently, they have diversified into copper as well as other hard minerals and, in one case, all the way to general merchandising. Despite the hedging, all of them continue to budget significant amounts of capital to their traditional lines of business. But one wonders for how long.

One major independent company, Ashland, recently announced its decision for strategic reasons to sell all of its production and exploration activities and to concentrate solely in the marketing and refining areas. Another much smaller independent testified in recent oversight hearings that offshore activity had become such a hassle that it was seriously considering getting out -- an ironic twist, given that the OCS Lands Act Amendment was intended in part to promote wider participation by smaller companies offshore.

Given the proliferation of checks and balances already built into both its internal and its external life, industry necessarily questions the need for expanded public participation in resource management, whether onshore or offshore. But to be realistic, once the process has expanded, how do you cut it back?

What other alternatives may be available to us? We can of course live with what we have and lose ground internationally; but ultimately, to lose ground internationally is also to lose it domestically. If we must continue to operate within the triangle, it is obvious that new legislation or legislative amendments designed to make the rules clearer and facilitate the process of planning would be helpful to all three entities. And in contemplating new legislation, environmental interests might be well advised to consider the possibility of a Proposition 13-type backlash. At some point in the cost spiral, the public and its lawmakers may well decide that the cost of environmental protection has begun to exceed the benefits, at which point, if history repeats itself, they overreact. Believe it or not, industry would be as unhappy as

anyone else to see that happen.

The final alternative, the unmentionable one which must be mentioned is, of course, to eliminate the triangle, but to do so in the manner already adopted by so many countries in both the fully developed and the emerging world. You simply eliminate the distinction between government and industry through full or at least partial nationalization of industry. The conflict goes back to being a one-on-one situation, that is, government versus the public.

Quite apart from being a terrifying concept philosophically, at least to me, hard experience internationally shows that it might not necessarily produce any economic or technological efficiencies. Some would argue, however, that it would simplify the process of political management. Whether this is necessarily in the public interest is obviously a matter for public debate.

As a matter of fact, we may soon be the only country in the world of any consequence which does not have a wholly owned or partially owned national oil company, in an era where government-to-government dealing in the oil business is becoming increasingly the rule. I only hope that we can continue to live with and perhaps be proud of such a distinction.

In conclusion, I would like to share with you the nightmare that I had last night. The scene is the Super Bowl. There are 55 seconds left on the clock, and the team that I have money on is down by three points and has the ball, first and ten at the fifty-yard line, no time-outs remaining. My guys are in a huddle where the next three plays have just been called, and about that time this huge lineman says, "Hey, wait a minute. Let's have a little public participation in this deal. I don't agree with the play selection; I think we ought to talk about it." From there on, the rest of the dream consists of yellow flags and a ticking clock.

GENERAL DISCUSSION

H. WILLIAM MENARD, Co-Chairman: I look around this audience, and I see faces like Brackett Hersey, Russ Wayland, and Ned Broun. They have been involved in this business for a long time. It is kind of disturbing to think of the opportunities lost, or how things have changed, or how the world changes. Just 25 years ago, when these concerns began to crystalize, the problem was for the few people who were enthusiasts to try to get the rest of the people to realize that there were opportunities out there. There wasn't anybody against it, it was just that most people didn't care. From the two speakers presenting different viewpoints on national needs and industrial problems, we find that the real concern now is the complexity of our society. Moreover, the same people who have been trying to push now see that the things that they might have accomplished 25 years ago, if there had been support for what they were trying to do, are being accomplished in other countries and that the principal problem now is that we have very

divergent views. They are all legitimate views, nobody is questioning that. But it is because of this diversity of views that we now are in our present state. I am reminded of Pogo: we have seen the enemy and they are us. This is what the Forum is for -- for various viewpoints to surface, for people to raise questions, for people to discuss what can be done and present their viewpoints.

We now come to a time when we ask you to go to the microphones, identify yourselves, and state your questions. In this context, there was a lecture delivered by the Nobel Prize winning British physicist, P.A.M. Dirac, who was famous for many things, including inventing a new way to do knitting when he was told there was only one way. He invented purling when he was walking home. He was a man of remarkable genius, but a very simple mind in many ways. He concluded his lecture, and somebody got up to say, "Professor Dirac, I do not understand what you mean by the equation you have written on the left side of the board," and sat down. There was a long silence, and Dirac looked at the audience. There was a longer silence, and people began to get a little nervous. The Chairman said, "Professor Dirac, would you care to address that question?" And Dirac said calmly, "That was not a question; that was a statement."

Now, could we ask you to focus on questions and discussion, please?

EDWARD CANNON, United States Coast Guard: This is more in the nature of a footnote to John Craven's very erudite interview. Constantin Doxiadis, the modern Greek city planner, once coined the term "ecestics," or the science of human settlements, and he foresaw man, or population concentrations, as advancing from a metropolis, to a megalopolis, to a final point, the ecumenopolos. I don't think we are ready for that, just as we have not been ready in our various public policy deliberations to define composite terms such as ocean policy or perhaps coastal zone management. But I think what we are ready for is closer functional descriptions.

John, your vision -- which you may call aquapolis and we might call transopolis or oceanopolis -- has brought us a little closer to reality in terms of functional application. Transportation has been a vitally overlooked element in all of our various deliberations of economic policy.

The other philosophical side of this is, I think, that too often as we go about the process of identifying and programming our resources, we do it for political visibility and immediacy. Rarely do we program our resources, money, and people with socioeconomic vision and imagination. I think that your perceptions have brought us a little bit closer to that vision. Thank you.

MENARD: That was in fact a statement and not a question, but it is within the context of the Forum. Is there another brief statement, or a lengthy question?

S.B. GOSWAMI, M.D.: Is this program supported by and representing

the big corporations or the public?

MENARD: Well, John, I think you should address that.

JOHN P. CRAVEN: I was fired from Standard Oil of California in 1947, and I have not been associated with it since that time. I served on the Nixon committee to look at the Santa Barbara oil spill, and I was almost ruled off the committee because of my prior association with the oil companies. To that extent, all of us have at one time or another in our lives been associated with a corporation. Indeed, it is the very nature of our society that we have depended upon the corporation for social innovations. And indeed, this is the debate which has been raised. It is the debate with which we are very much concerned on a national level.

As we look at other nations like Japan, which operates as a corporate state, many of us are disturbed by the fact that this corporate state is incompatible with our own notions of what a society ought to be. We are disturbed by the fact that this corporate state is doing the things that we think that our society ought to be doing. This is our dilemma. We are not, any of us, representing the notion that what is good for the corporation is good for America, but we are looking for solutions that are good for America in terms of the kind of society that we have postulated for ourselves. We are frustrated because we don't seem to be able to accomplish this.

The best way I can respond to your question is: No, we don't represent the corporations, but we are frustrated when we see that the corporation in the U.S. is less able to carry out its limited, albeit important, role in society.

GOSWAMI: But why do we have to look toward Japan? Why don't you double up our own programs or models?

CRAVEN: Oh, I don't look at Japan. I do look to the U.S. But let me give one brief, frustrating example that appeared on the screen. This was the development of the SSP ferry, the semisubmersible platform ferry. This concept was a development of civilian scientists in the United States Navy, who saw that this was a new breakthrough in transportation by sea. This development was published in the public record, and the State of Hawaii, where I live, thought it was a wonderful concept to implement in terms of a ferry system between our Hawaiian Islands. So the Department of Transportation of the State of Hawaii went to American private industry and asked them to bid on the construction of a semisubmersible platform ferry between the islands.

No private industry in the United States responded, and the reason is that many of them felt that the total set of regulations that we have imposed in this society were such that the SSP would never pass Coast Guard standards or specifications, or get through the environmental and regulatory hurdle that is required for innovation in our society. At the same time, there were some visitors from Japan who came to Hawaii and who sat down with us and looked at the SSP. They asked for and

received the master's thesis that was done at the University of Hawaii; they received the public information that was published by the Defense Department with respect to this; they did a free study for the State of Hawaii on what kind of an interisland ferry system we could have if we could get anybody in the United States to build it. And they carried this back to Japan, where they instituted their own interisland ferry system.

Now, it is both fortunate and unfortunate that we can't buy the Japanese ferry system, because the Jones Act forbids us to do so. It is fortunate because we don't want to look to Japan; we would like to have our own semisubmersible platform ferry. But the frustration to me and many others is that we won't get the American ferry either, because something about our total process is such that it has stopped, absolutely stopped cold, innovation in the ocean. There is always a good excuse why they can't do it. The net result is that we have no semisubmersible platform ferries in the United States, we have no hydrofoils in the United States, we have, effectively, no surface effect craft in the United States. Almost all of the innovations in ocean technology which are environmentally sound and of benefit to the public do not appear on our shores. I don't want to rectify this by changing our form of government or our society; I want to rectify it by getting the public to be angry. I want you to be angry over the fact that we don't have the benefit of modern ocean technology for the people of the United States.

GOSWAMI: But then you haven't really educated the public or informed the public.

MICHAEL R. NAESS: As I understood your initial comment, it was based on the list of supporters of this program, and in fact roughly 50 percent of the entities on that list are corporations. I would also point out the other 50 percent of the supporters on the list are agencies of the government. But I will speak to the corporation side of it.

Corporations have different ways of expressing their point of view in trying to communicate with the public. I think I made it clear in my talk that I believe we have got to do more of this, to find better ways of communicating with the public, however handicapped industry may be in that respect. Some people take out full-page ads in the Wall Street Journal. My particular problem with that approach is that most of the public doesn't read that stuff, and that it doesn't provide a mechanism for feedback. I particularly think this kind of program is valuable because -- at least for a short period of time -- you have no choice but to listen to me. You may not agree with me, but you have to listen. And second, once I have said what I am going to say, you can speak back. That to me is a lot better than the Wall Street Journal. Industrial corporations are all trying to find a better way of communicating and understanding the public's position, as well as the government's position.

MENARD: Let me speak for a moment on the position of the National Academy of Sciences on this. If the National Academy of Sciences cannot maintain a reputation for neutrality and credibility and the highest quality of individual participation in its activities, then it has lost. Therefore the Academy really devotes an enormous amount of time and effort in trying to ensure that people who come before you are presenting a range of views. That is one thing we have learned the hard way, that you can get a group of scientists with impeccable reputations to talk about an issue, and in fact they all have exactly the same background and viewpoints. So over the years it has been established that we have to seek a range of viewpoints in order to be presenting a fair range of national opinion. We must have different people talking, and you are all here to talk.

So to the extent that it is humanly possible for an organization that values its reputation above all things to produce a program in which that reputation will emerge unscathed, that is what the Academy is up to.

P.V. TAWARI, Mitre Corporation: Mr. Craven talked about high-density city core offshore sites that might solve environmental problems. If you have these concentrations, are you actually alleviating environmental problems?

CRAVEN: It is difficult to answer that question without saying, in a sense, "Trust us." But the answer is that in studying this concept we placed a very, very high priority on environmental effects, and the conclusion that we came to is that wherever man is, he must blend with his environment. And therefore he must blend either with the land, the atmosphere, or the sea.

We asked ourselves: Which environment is it easiest to blend with? Our conclusion -- which I think is subject to challenge, but I would like to see it debated because it is a conclusion which is generally at variance with the public perception -- is that it is easier to blend with the sea environment than it is with the land environment.

There are several aspects of this. Just imagine, for example, the effect on the landscape if a 200,000 ton truck were to drive down Constitution Avenue. First, it probably wouldn't make it more than 10 or 15 yards before it would plow up the road irretrievably. At the same time, a 200,000 ton ship which moves through the ocean environment creates a wake which persists for perhaps half an hour. There are many such comparisons.

This is not to say, as people often impute to us, that we are proposing that the ocean can be treated as an environment which is nonpollutable. That is not the case. But if one examines what one has to do to blend with the ocean environment in such a way that the effects on the ocean are localized, as contrasted to what one would have to do on the land or in the atmosphere to make the effects localized, one discovers that the ocean effects are much easier to handle.

Let me give you one example of the frustration that we feel. There

has been a great deal of discussion about ocean disposal of sewage. There are many of us who have studied the problem with a great deal of care and understanding, and believe that the most acceptable way to dispose of sewage in an ocean environment is to discharge it into the ocean essentially with only modest primary treatment. There is good argument why this is environmentally superior to treating sewage and putting it in the ocean, mainly because the ecosystem likes raw fertilizer and not treated fertilizer. However, our society has decided that we should put fresh water into the ocean, and substitutes thereby land based plants, secondary and tertiary sewage plants. Anyone who has driven by a sewage treatment plant can smell it two or three miles away. No consideration has been given to the amount of real estate which has been filled up by a treatment plant whose primary purpose is to treat sewage. We perceive that the ocean can take nearly primary sewage in a beneficial way, and that therefore as we move high density societies onto the ocean, we can discharge that sewage effluent, properly treated in a concentrated way, into the ocean in an environmentally sound way, the net effect of which is to improve the primary productivity of the ocean, as contrasted to handling the same problem on land, where we now spend a great deal of energy in order to treat sewage to produce an effluent which is really unacceptable.

PUBLIC INTEREST AND PARTICIPATION: THEORY AND PRACTICE

Oliver Brooks
Consultant and Chairman
Maritime Transportation Research Board Ad Hoc Committee on the Impact of Maritime Services on Local Populations

Despite the legitimate questions that have been raised here -- both explicitly and implicitly -- I remain frankly and unabashedly a protagonist of public participation. I will confess that I am fully aware of its potential vagaries and of the problems that can arise from it. But on balance, I would argue that it has a great deal to offer.

Let me very quickly give you a sense of where I come from, because obviously it is important here to establish some framework for one's point of view. I come, first of all, as chairman of a panel of the Maritime Transportation Research Board, which is a piece of the National Research Council and the National Academy of Sciences. The panel's charge was to analyze the local impacts stemming from maritime-related facilities and services. In the course of our enterprise we took a look at two of the four illustrative cases that are to be studied in this Forum. Our final report makes a strong case for public participation -- early, energetic, and eclectic.

Second, I have served as the lead person on a number of substantial urban real estate developments that were accompanied by all of the complex preliminaries that are a way of life today: environmental impact statements, zoning hearings, citizens' advisory committees, uncounted neighborhood meetings, interest subsidy arrangements and mortgage guarantees from the Department of Housing and Urban Development, and almost inevitably, a harrowing time schedule.

Third, several years ago I served as the chairman of the key citizens group in what in its time was the most widely publicized environmental battle in my home state.

In short, I have been on all sides of the table, and in the process I have been deeply involved in development efforts that have had a large measure of public participation.

I am always troubled by the use of the term "public participation,"

because often people attempt to equate public participation with public interest. There are many organizations in this country which call themselves "public interest organizations." I am troubled with the fact that it is a term which is used relatively loosely and sometimes with precarious justification. There is an important distinction to be made: public participation is not, with any certainty, synonymous with the public interest.

Some observers have suggested that public participation should be argued for as orderly, equitable, and invigorated democratic process. I tend to shy away from that sort of rationale on at least two counts. First, it may be premised too much on the town meeting principle. While that imagery may still be attractive, its broad applicability in a nation of more than 200 million people is certainly arguable. Secondly, public participation is vulnerable to the same distortions of democratic equity as almost anything else we attempt to manage in our enormously complex society. We should not attempt to claim for it a measure of infallibility that it does not deserve.

I would argue, to the contrary, that public participation must be justified primarily on the basis of what it can potentially contribute to the planning and development process -- to its substance, its timing, the level of public understanding that is associated with it, and its impacts, both real and imagined. Further, I would argue that public participation must be evaluated on its ability to contribute constructively to the process of mitigation and compensation, particularly in instances where physical development for economic gains conflicts with other uses such as recreation, open space, or residential amenities or when it imposes a negative environment on parties not formally associated with the development process.

It is my belief -- and it is a belief that I think was shared by most of the members of my panel -- that public participation can in fact be justified on these grounds in a great many instances. Most often, the problems that do emerge are problems of balancing legitimate objectives that conflict because of finite resources rather than because of anyone's malevolent purpose.

There are certainly countless instances in which the lack of this generalized effort called public participation has created a backwash of suspicion, rancor, and obstructive legal actions. To the extent that there is a legitimate debate about public participation -- and based on the review comments that I received in advance of the release of our report, I can assure you there is one -- it should focus, it seems to me, on the process of decision-making rather than on the specific decisions that result.

We have to recognize the fact that many maritime-related developments are certain to be intrinsically damaging to one group or another of neighbors or other interested parties. Public forums or candid dialogue cannot alone be expected to liquidate these damages. What they can do, it seems to me, is to place compensation or side payment or special adjustments at the core of the discussion, thus looking toward an improved decision process.

Yet having made this point, one must recognize the self-evident problems that are associated with the public participatory process. Tersh Boasberg, a Washington attorney, in a recent paper done for the National Science Foundation put it in these terms: "As a concept, participation is necessary to invigorate democratic government, but as a procedure it may encumber the decision-making process of the state. Granting government's right to rule, it may also limit its ability to rule efficiently. The importance of an enlightened public and a clearer articulation of diverse social values that emerge from participation must be weighed against the real necessity of efficiency in the decision-making process. Thus, there remains a persistent tension between the ideal of democracy and the pragmatic reality of it."

This thinking process is not a new one in the context of 1979. For two decades or more -- and Mr. Naess certainly referred to this -- at both the legislative and the executive level we have been grappling with difficult issues that have become more and more apparent. One of these is interminable deadlocks or unreasonable delays. One of the basic approaches in some of our public participation efforts has been an effort to avoid some of these problems.

I suppose I ought to review very briefly some of the recent past history of public participation. In the sixties, it was a factor in the Model Cities Program and in the Economic Opportunity Program, which carried bumper stickers with slogans like "Maximum Feasible Participation" or "Neighborhood Self-Determination." The results, at best, were mixed.

In the early seventies we saw the Corps of Engineers launching a major effort to upgrade the opportunities for public input in its programs. A pamphlet called "Citizen Involvement in the Corps of Engineers Planning Process" emerged, as well as a fishbowl planning effort in Seattle that received considerable attention. Manifestly, two of the functions were public relations and information in the sense of establishing the validity of the Corps of Engineers' role. But perhaps the most important thing that the Corps attempted to emphasize with this effort was public participation as a device for conflict resolution.

By the seventies, most of the major planning-related legislation that emerged from the Congress -- the Federal Water Pollution Control Act, the Coastal Zone Management Act, the National Environmental Policy Act, and many others -- included solid language on the necessity of public participation in the planning and development process.

The Community Development Block Grant Program, representing as it did an effort to downplay the federal categorical programs and to give some sense of self-determination back to the local communities, contributed further to this trend.

More recently, we have seen the emergence of the Science for Citizens Programs of the National Science Foundation, an effort on a modest scale to provide public funding to assist nonprofit organizations to develop their own technical skills and understanding in dealing with complex public policy issues.

In the past two sessions of the United States Senate, we have seen

Senators Kennedy and Mathias pushing a bill to provide modest funding for nonprofit corporations as a direct encouragement to their participation in the federal governmental decision-making process at the agency level. The lesson of this brief history is clear: Public participation in this country has been put to serious test for the last two decades at least.

It is against this background and within a framework of illustrative cases, some of which are summarized in our final report, that the Maritime Transportation Research Board panel considered the present state of the art of public participation and its relation to onshore development requirements of the maritime community.

At the outset we concluded, with some chagrin, that the issues involved are much softer and lumpier than the issues with which the National Academy of Sciences is normally confronted. They are not ones which lend themselves to a neat compilation of empirical data and an equally neat conversion of that data into a set of widely applicable recommendations. We were struck by the fact that sectional differences of a political and cultural nature in many instances had a profound effect upon the type of public participation that evolved or was possible. Nevertheless, we felt that public participation, even if not precisely defined, should be part of the development process.

One of our key recommendations argued for what we call a "participation audit." The participation audit, as we see it, should be a quid pro quo prior to the time that an application for a permit or license is accepted by the appropriate governmental agency. The basic thrust of the audit is to determine whether an applicant has reasonably attempted to involve impacted and affected citizens and constituencies, and also relevant local, state, and federal agencies, in the predevelopment planning process. It attempts to make the participatory process a forethought rather than an afterthought, which it often has been.

This recommendation presupposes the strengthening of the so-called lead agency concept, which is already well-tested at the federal level. It is thus contingent upon avoidance of interagency squabbles and ambiguities that have sometimes unnecessarily retarded the designation of a specific lead agency, and it is dependent upon a high level of creativity and flexibility on the part of the reviewing personnel of the lead agency.

To those who would protest that a participation audit would be just another large shoal in an already reef-strewn development ocean, we would argue to the contrary. There are simply too many instances in which public participation has been too little and too late, and the result has been long delays and even aborting of worthwhile projects. Our emphasis is on the pre-permitting stage, hopefully a time for identifying and resolving potential conflicts and developing mutually acceptable alternatives before the key actors are entrenched into positions from which they cannot retreat.

We went on in our panel report to argue for special attention to the problem of maritime facilties that are specifically charged with the

handling of hazardous materials, urging that there should be an absolute requirement that a broadly based citizens' committee be involved at every step of the way as a precondition to the permit application.

Parenthetically, I am struck by the fact that in my own adopted town of Boston in the late 1960s, the first LNG handling facility in the country was built in the core of the most densely populated 10-mile square in the entire New England region. The job was done remarkably quietly, with little civic flak accompanying it. I doubt whether that could or should happen today.

Now, quickly, let me suggest that having attempted to make any case for public participation, there are a number of questions which need to be asked. Time will force me to leave these issues in the form of questions rather than hazarding some correlative answers.

First of all, if we don't have public participation, how do we deal with the multiplicity of citizen groups that now exist in this country who are seeking a rationale for their own individual participations in governmental decisions? Just to give you some sense of what is out there -- and this is drawn from a recent book that was edited by Professor Stuart Langton of Tufts University -- there are 8,000 neighborhood organizations in the country; there are 10,000 block associations in New York City alone; there are more than 100 national public interest organizations with Washington offices; there are 400 consumer groups nationwide; there are 350 environmental action organizations. The Office of Neighborhood Voluntary Associations and Consumer Affairs at the Department of Housing and Urban Development recently issued a report which indicated that there are 15,000 organizations which qualify under its particular rating system. This is a source of political and civic energy looking for constructive contributions to make. We cannot turn our backs on a resource with this enormous potential. If we do so, we do it at our own peril -- a peril that is not easy to gainsay.

The second question is: How can we build into the public participatory process a form of political management that makes some sense? When I use the term "political management," I do not use it in a way that is intended to suggest omniscient manipulation, but rather to point toward efficient use of significant human resources.

Third, how can we find creative ways to build in the sense of technical competence and understanding that is often necessary with respect to these specific development issues?

Fourth, how do we really deal with the problem of what I would refer to as the transaction costs of public participation? How much of this is a cost that is legitimately chargeable to the development and chargeable, therefore, to the initiating agency that is carrying forward the development?

Finally, what can we do about the special problem of maritime-related facilities for the handling of hazardous substances? In this case the perils that are imagined are perhaps potentially almost as threatening as the perils that are real. How do we deal with this problem with some sense of equity that still recognizes the profound national needs that

underlie the proposal of such facilities?

That, in essence, is the problem that we have before us, and hopefully we may have a chance during this Forum to discuss it more thoughtfully.

PUBLIC PARTICIPATION AND THE COURTS

E. Edward Bruce
Attorney at Law
Covington & Burling

In accordance with the full disclosure rules that we have been enjoined to follow, I should tell you that my practice in large part over the last several years has been on behalf of what can be called the offshore oil industry, in connection with a number of cases involving offshore oil and gas development in such areas as the Gulf of Alaska, the Tanner Banks off Southern California, the Baltimore Canyon, and most recently, the Georges Bank.

In one sense I will disagree with some of the general points that Mr. Brooks made, but in another sense I agree with him. Specifically, I want to advocate that there be the most limited form of citizen participation in policy-making after the policy has been decided within the appropriate branch of the government, executive or administrative, where jurisdiction is committed by statute. I am very skeptical about the role that the courts play in the evolution of policy in suits normally prompted by the complaints of so-called citizen or public interest groups.

I would like to begin by quoting a passage from a recent opinion which might be typical of the views of a court that has to speak to the complex issues that are put before it in such a case, but is unusually candid. The judge said the following:

> The Court has before it questions of the highest importance, the greatest complexity and highest urgency. They arise as a result of high legislative purpose, low bureaucratic bungling, and present inherent difficulty in judicial determination. In other words, for the high purpose of improving and maintaining felicitous conditions in the coastal areas of the United States, the Congress has undertaken a legislative solution, the

> application of which is so complex as to make the matter almost wholly unmanageable. In the course of the legislative process there obviously came into conflict many competing interests which, in typical fashion, the Congress sought to accommodate, only to create thereby a morass of problems between the private sector, the public sector, the federal bureaucracy, the state legislature, the state bureaucracy, and all of the administrative agencies appurtenant thereto. In whatever technical form the questions and issues are here presented, they resolve themselves into the familiar situation in which a court must sit in some form of judicial review of administrative action -- and it isn't easy.

Given the focus of this Academy Forum, it is of more than casual interest that these words were uttered by Judge Kelleher in passing upon the first judicial attack on NOAA's approval of a coastal zone management program.

Not every judge has been as reluctant as Judge Kelleher was to embark upon a policy-making function in the offshore or coastal area cases. For example, in the Baltimore Canyon case, Judge Weinstein, the trial judge, not prompted by the invitation of any of the parties, decided that it would be a good idea for the government to lay out hypothetical pipeline routes to bring offshore oil to shore, even before there had been any exploration to give us data to tell us where the oil was, if it was there at all. Judge Weinstein's initiative in this regard was soundly and decisively rejected by the Second Circuit, who declared that he had allowed "his views regarding the substance of the Secretary's proposal to becloud his understanding of his reviewing function, leading to his unfortunate characterization of the Secretary's motives, his substitution of testimony received for that considered by the Secretary, and his adoption, sua sponte, of grounds for inadequacy that were not suggested by the parties."

These portions of Judge Kelleher's opinion, and of the Second Circuit's opinion in the Baltimore Canyon case, suggest that coastal and ocean policy issues raise extraordinary problems for the court. In seeking explanation for this phenomenon, I resort to a premise that I think the case studies of the Forum will document -- that these coastal and ocean policy cases raise complex issues, involving competing values that are very difficult for the courts or anyone else to sort out.

I will also posit that Congress has been, and congenitally may be, unable to provide significant guidance as to how these conflicting values are to be resolved. Take the case of the recently enacted OCS Lands Act Amendments. In the initial sections to that act, the Congress articulated its purpose of making oil and natural gas resources in the OCS available to meet the nation's energy needs as rapidly as possible and, among further goals, balancing orderly energy resource development with the protection of human marine and coastal environments. Now, that is a very worthy goal, but how is it to be accomplished? The clients that I represent hold the view, supported by evidence, that there really isn't much of a conflict between offshore development and other possibly

impacted interests. People who bring litigation to test the Secretary's leasing program hold a contrary view. They think that the Gulf of Mexico experience simply isn't applicable to their part of the country.

Now, I am not going to try to debate the merits of that question. But let's assume -- just arguendo, as lawyers say -- that there may be a conflict at least of some order. There are ways that conflict can be "minimized or eliminated," another direction Congress has given us in the OCS Lands Act. On the other hand, you could say no offshore oil development. That will eliminate a conflict. At the other extreme, you could say development full speed ahead, never mind anything else. That is another way to eliminate a conflict. And in between these extremes there is almost an infinite variety of measures that can be decided upon to mitigate or minimize conflicts between offshore oil development and other interests.

The question is: Where should the balance be struck? Should it be struck on the basis of the need for more oil, because of our growing dependence on increasingly insecure sources? Or should it be struck on the basis of weight attributed to other interests? Initially, this balance will be struck by the Secretary of the Interior and his staff, as affected by the views of the Secretary of Commerce with respect to her fishery jurisdiction and coastal zone management jurisdiction and the views of the Secretary of Energy in connection with his responsibilities.

Now, that executive balancing process -- I not only concede, but I stress -- is very properly the subject of the most intense citizen participation. State officials, industry representatives, consumer advocates, environmentalists, fishermen, and what have you, should and do play a very important role in apprising those decision-makers of the relevant facts and advancing arguments as to their interest in how this balance should be struck.

The views of these people are heard, but there is no one who is going to say that every one of those interests will be satisfied after that balance is struck by the Secretary of the Interior. And given the very liberalized rules of what lawyers call standing -- that is, the allowance to bring a lawsuit these days -- it is almost inevitable that one or more segments of the public, whatever that is, will resort to a court to obtain a rebalancing of the interests that is more in keeping with their own point of view and their own interests.

It is at that point that the issue I am addressing arises. It is then that the courts are asked to come in and speak to the substance of the policy questions that have already been decided in the executive or administrative branch.

Now, let me put to one side at the outset the easy cases, the cases where an administrative or executive officer has simply ignored, refused to follow, the commands of a statute. If an agency proceeds to develop a major federal program without the environmental analysis required by NEPA, then the courts do no policy-making in enforcing NEPA to the extent of requiring an environmental impact statement.

It is rare, however, that the issues are this clear cut. Except for

relatively unusual situations, the issues of agency compliance in the regulatory cases that I am speaking of normally involve the issue of whether the decision-maker has gone far enough or has moved fast enough to respond to the congressional purpose in the statute that the plaintiff is relying upon.

It is here where I think the courts ought to be most reluctant to move in the area of adjudicating claims. I hold these views for a variety of reasons.

In the first place, the judicial system seems to operate at its worst when it asks itself the question: How much is enough? We have had Section 2 of the Sherman Act, which condemns monopolies, for about 100 years. In that 100 years the courts still haven't really given a very good answer to the question of how much market power constitutes a monopoly, short of the obvious case of 100 percent. In the constitutional area, the general evolution of the one-man one-vote principle for reapportioning state legislatures towards almost an absolute requirement of perfect apportionment illustrates the point in a different context.

Now, the reason I think the courts have such difficulty with these balancing or quantitative cases is that they are obliged both by tradition and, in this country, by the role that the Constitution gives them, to explain their decisions in accordance with a generally applicable principle, what Professor Wechsler, a noted constitutional scholar, has referred to as a "neutral principle." Judges can do this with varying degrees of success in normal judicial cases by deciding which of several competing principles decides a particular case.

In the First Amendment area, for example, once a court decides that the utterance is "speech" within the meaning of the First Amendment, it will not thereafter normally weigh the substance of the government's interest in suppressing that speech or abridging that speech to decide the case. Having decided the matter is speech, the primacy of the First Amendment controls; the case is decided.

I submit it is impossible for a judge to address the kind of policy issue that I am talking about here in those terms. Congress, for example, has identified both accelerated OCS oil and gas production and the protection of fisheries and other interests as being important, but it hasn't told us in any clear language which of those, if any, are of primary or supervening importance. Certainly nothing like the primacy of the First Amendment can be attributed to either one of them.

Thus, ultimate decisions in these areas must rest upon a compromising and a balancing between principles. It is there that the judges, I think, have the most difficulty articulating what they are doing and making a principled decision.

A second reason for my concern with the court's entry into these areas arises out of the circumstances under which these cases are decided. In a great many cases, the basic decision in these matters is made on a hastily filed motion for preliminary relief. In the Georges Bank case, for example, the plaintiffs filed their basic papers, their legal arguments, their evidence, and their exhibits six days before this

major financial transaction was to take place. Now, the judge devoted himself to the case to the extent he could, clearing his docket of other matters. But he was still forced to make the decision on what was really a few hours' reflection. Referring to the Secretary of the Interior's decisional process, here is the way he put it just before he issued his preliminary injunction:

"To what extent is this process permissible and indeed mandated by the applicable statutes? That is what I am going to be trying to figure out over a tuna fish sandwich between now and 1:30 or 2 o'clock."

It does not reflect adversely on the trial judge to suggest that in these circumstances he was not in the position to address himself to the issues in the same depth as the Secretary of Interior and his staff, who had spent literally man-years of analysis and preparation before the decision.

A third point is that even if the judge had all the time in the world to address himself to this or similar cases, he would have to do it without any technical staff or any education or expertise that would allow him to intelligently choose between the conflicting expert testimony that is inevitably given in a case of this sort.

A fourth point I make in this regard is the unique bias or one-sidedness of the judicial process. The courts have ample authority to issue injunctions so as to stop or delay projects. They have little, if any, authority to order projects to go forward which they think are beneficial. In OCS leasing, for example, the Secretary's decision not to hold a lease sale, or to delete a number of tracts from a particular sale, has never been subjected to any form of judicial review. So the impact of the judicial process has to be one of stopping, rather than a balanced impact of stopping and starting.

A fifth point I make is that it is very difficult to obtain prompt appellate review of individual trial judge's decisions. It is even more difficult to get Supreme Court review of intermediate appellate court decisions that will give you a consistent, uniform pattern of national policy across the courts in this country. Therefore, those who would urge an active role for the judiciary in the evolution of policy must anticipate an almost crazy-quilt pattern of decisions, in which more objectionable projects are not halted because they happen to be filed in a court with a pro-development judge and safer projects may be held up interminably in the hands of an environmentalist court.

Let me close by anticipating a comment or two that some of the audience might make. I will concede that the judiciary in this country today has a very great impact upon our day-to-day activities and the long-term direction of this country, through its role in the fashioning of what I would call constitutional policy. It was, after all, the judiciary that gave birth to, and in some instances interred, such concepts as freedom of contract, separate but equal, and one-man one-vote. Thus, it may well be contended that given the huge role the judiciary plays in enforcing the Constitution, I am dealing with a relatively trivial matter here in addressing these regulatory issues.

My answer to this is that our constitutional system really seems to

leave us no choice but to place in the hands of a life-tenured, independent, nonpolitical judiciary the final decision on constitutional matters. One can easily argue that the very existence of constitutional commands implies an independent judiciary to enforce those commands upon a political legislature and a political executive. That same justification of necessity does not apply to the situations that I described.

Moreover, while there is an occasional quantitative or balancing issue in constitutional cases, such issues are relatively rare. Most cases are decided on the basis of the identification of a principle, what I would refer to as a qualitative analysis. Beyond that, while there are exceptions, such as the Pentagon Papers case that was decided in a few days in the Supreme Court, for the most part constitutional cases don't get decided in the haste of a motion for preliminary relief, but are tried after the full development of a record, after judges have had time to stop and reflect about what they are doing.

Finally, most of the case law in the constitutional area is made in the Supreme Court, not in the lower courts. And that, as I said, really can't be done in the regulatory cases, given their number and complexity and the difficulty of getting such Supreme Court review over all these matters.

I thank the Forum for allowing me to set forth my views, and I await with interest other views, comments, and questions.

GENERAL DISCUSSION

JAMES CURLIN, Deputy Assistant Secretary for Policy, Office of Ocean Resource and Scientific Policy Coordination, Department of Commerce: We have had a variety of viewpoints. Mr. Craven started out by posing an ethical question, one of an evolutionary philosophical base -- that of accommodating society with the ocean. Mr. Naess followed with a very straightforward statement of industry's role, particularly industry's perspective of its role in the entire process. Mr. Brooks -- unabashedly, as he said -- supported the public participation concept as an important component of the process. Mr. Bruce did an excellent job of explaining how the courts interact in this entire process, and more importantly, what their limitations are.

I believe what everyone suggested indirectly is the evolution of an abstract term in the equation of national interest. It was brought out, implicitly at least, by Mr. Bruce that the Congress, to whom we often turn for a statement of policy, often falls short. I can assure you, having worked with the Congress in the development of legislation, that the provision that gets the least attention is the preamble and statement of policy that the legislation is supposed to implement.

Given that, I think what we have described here is what might be considered an ad hoc evolution of the national interest through an interactive process involving many public and private factors. The

questions of those in the audience must be: Where are we? Where do we go from here? Perhaps we will see some answers in the case studies as they evolve.

My questions to the panel in general are: Is this the best way we have to seek a definition of national interest, given the pluralistic society in which we exist? Is this the way we have to go about each and every decision? Are there inefficiencies? Are there inadequacies in the process toward which we can turn some creative energy? Can we, for instance, identify a national interest in a more certain way so that when we do develop resources offshore in a specific region, citizens in the interior of the country -- who also have these decisions -- will have an opportunity to involve themselves in a public participation process along with those in the coastal reaches?

So when we talk in terms of public participation, we should ask: What public? If you do befoul the beaches off someone's home, that is important. But it is also important that somehow or other the people who cannot speak for themselves are spoken on behalf of, and that the concerns of those in the center of the country are also reflected.

How does this problem fit into the entire scheme and range of attitudes that have been expressed?

OLIVER BROOKS: That is a pretty large question. I will take a whack at a very small piece of it.

This whole problem of defining the public interest or the national interest is a very difficult one. We have found this particularly true within the framework of our study, which was essentially directing itself toward the local implications of maritime facilities. The local impacts may be very different from the national ones.

I don't have any ready answers on how one sorts this out. A good case in point is the tried-and-true housekeeping function of port and harbor dredging. It is very easy to make a case for the fact that the dredging permitting process should be simplified a great deal. It is incredibly cumbersome and complicated now. There is one case of a $16,000 routine annual dredging job on the West Coast in which the passage of time from permit application to permit approval was 327 days.

E. EDWARD BRUCE: Let me certainly concur with that statement, but let me offer a slightly different approach to it.

There are a lot of courts, a lot of judges today, who welcome the policy role that is left to them by the vacuum that Congress often creates. Now, I submit that if there is a problem in having courts do what they are often asked to do, and I think there is, the only way it can begin to be solved is for the courts to say, "We won't do it any more. That statute is too vague. You, Congress, have to bite the bullet."

I have never really participated in the legislative process; I have never been on a congressional staff, but it seems to me it is very easy for Congress to vote for statutes that proclaim all kinds of wonderful values for everything, on both sides of every issue. And it is going to

continue to do that so long as the courts are willing to take that legislation and put their own stamp on it. That is one approach I would suggest: Force the Congress to be more specific.

IRA DYER, Professor and Head, Department of Ocean Engineering, Massachusetts Institute of Technology: I think this question can be addressed to the entire panel. I ask you to consider what implications, if any, the responsibility for public participation places on the educational system in this country. I would include especially primary and secondary education, but I would not exclude advanced education in colleges.

JOHN P. CRAVEN: I would like to respond to that question because that is what I was about to say in response to the first question. It seems to me that the basic problem is not the machinery of government, cumbersome though it may be, but it is educational and motivational. The thing which we are complaining about in the judicial process is not so much the decisions of the judges, but the motivations behind their decisions. If there were basically a motivational aspect on the parts of the courts which had a -- I am not saying this is a correct motivation, but a primary motivation which was moving toward the development and productivity in the society, vis-a-vis the environmental aspects of the society, they would be less inclined to put an injunction on an activity before they make a resolution of the decision, but to allow the activity to proceed ahead.

It seems to me our society is extremely responsive to the general notion that the ocean is a place to be protected, a fragile ecosystem. That has been encouraged by such books as The Frail Ocean, and by other better-written, well-meaning books, which have led the public to believe, understandably, that the ocean is such a frail ecosystem that if one dips one's toes, one is liable to destroy all of the life therein.

It seems to me the solution lies in the educational system at the elementary school level, and particularly in the television and public information media. For example, one can trace the whole protection of the whale and dolphin to the "Flipper" program, and a large number of people have made conclusions about the intelligence of dolphins as a result of their childhood exposure to their favorite program. It is to these areas of public education that I think we should be devoting most of our efforts, not to infer our own biases, but to demand more objectivity, more of a professional attempt to present to the public information which is closer to the scientific truth.

My own general feeling is that there will come a swing on the part of the American public -- it is already taking place -- toward recognizing the importance of productivity and of living an affluent life at a lower energy level, of the trade-off between the environment and the economy. And when that movement has matured, we will see our institutions responding.

MICHAEL R. NAESS: I would like to add in further response to the question of what responsibility the educational community has, not only that the marine ecosystem may not be quite as frail as is generally thought, but also that there is obviously an economic benefit to be gained by the nation as a whole from moving into ocean use. Further, it may be more than merely a national option to do so; it may be a national requirement in the face of international competition.

THE CASES

INTRODUCTION

Alfred A.H. Keil, Co-Chairman
Ford Professor of Engineering
Massachusetts Institute of Technology

On behalf of the National Academy of Sciences, I welcome you to this session of the Forum on Seaward Development, which I co-chair with H. William Menard, Director of the Geological Survey.

As a brief introduction of myself, I worked for nearly twenty years for the Navy in research and development related to improvement of naval ships. During that period I began to appreciate more and more as time went on the importance of many of the technological developments for nonmilitary uses of the oceans. After I left the Navy, where I worked as a civilian, I became a professor at MIT and head of the Department of Naval Architecture and Marine Engineering. There I began to broaden the department to include not only naval architecture and marine engineering of ships, but also engineering in the ocean environment. It is now the Department of Ocean Engineering, although it retains its naval architecture aspects.

I also served for six years at MIT as Dean of Engineering, and during that period I tried to create an environment that, first of all, emphasized -- in addition to engineering sciences -- a strong element of practical engineering and of viewing engineering in the context of the social functions which it serves. In addition, particularly with respect to the marine environment, I tried to create an academic atmosphere where faculty and students could work not only on engineering -- that is, the technological and engineering science aspects -- but also on the related dimensions of the social sciences, coastal zone development, environmental protection, and governmental influences.

I learned a tremendous amount through my participation in the Marine Board of the National Academy of Sciences, which grew out of an ocean engineering committee that increased its scope to include the uses of the ocean as they relate to engineering.

With that brief introduction, let me give you a quick status report. We have completed the first phase of the Forum, which provided an overview of four broad aspects of seaward development. There was a speech by John Craven on national needs and opportunities, a lucid summary of the industrial role by Michael Naess, a very exciting discussion by Oliver Brooks on public interest and participation, and an excellent review on public participation in the courts by Edward Bruce. A lively discussion followed those presentations.

We now move into the main thrust of the Forum, the sessions that cover the four cases. These cases will be operated in parallel, with two in the morning today and two in the afternoon.

We chose the cases to illustrate the complexity of the issues related to seaward development, taking actual cases in progress to bring the realities and the experience to this Forum. Particularly, we want to point out the various competing interests and the resulting conflicts. Each case will also show to what extent citizen participation occurred and what role it played.

These cases should give us practical experience to build on in order to put together some general thoughts and lessons. That summing-up session will take place tomorrow. It will be followed by a debate on Policy Alternatives, in which we will take our conclusions from the cases and present them as a basis for interaction with policy makers.

Each case will start with a brief overview by the case leader, followed by the statements of the panel members. Each speaker will mention his background so that you are aware of the resources you have with respect to later questions. But the audience is also a resource, and the real impact of the Forum comes from the debate between the audience, the case leaders, and the panel.

The first case is entitled "Oil and Gas from Georges Bank." We hope it will address the relationship between possible oil and gas findings on the New England Continental Shelf and the energy picture of New England, the national energy picture, New England fisheries and coastal recreation, and coastal zone developments, along with the legal and regulatory issues and the experience gained in public participation over the last few years.

The second case will be the SOHIO project at Long Beach, which is related to the transportation of North Slope oil to the U.S. market after it arrives in Valdez via the Alyeska pipeline, as is required by the U.S. legislation. The case specifically concerns the proposed oil terminal at the Port of Long Beach and the associated distribution system for shipping the Alaskan oil to refineries in Texas.

The SOHIO case must address a number of issues. The first is obviously the impact on the community of Long Beach. Closely related is the impact on the whole Los Angeles Basin if the SOHIO terminal is built. The discussion must also include the consequences if SOHIO is not built. What are the pros and cons of the other options, for instance transporting the oil through the Panama Canal and the Mexican Gulf to the Gulf Coast, which would result in higher transportation costs? Since the price of the oil is fixed by legislation, one result

would be that returns to the State of Alaska would be lower. Here is a topic that illustrates the complexity of the issues in seaward development and also the need for public participation. The key question here may be how far that public participation should extend.

Case III, the Louisiana Offshore Oil Port, draws on the experience of planning the first U.S. offshore terminal for importing oil by means of supertankers. About 100 such offshore terminals are in operation throughout the world, but it took an act of Congress, the Deepwater Ports Act, to make it possible to start planning the first one in the United States. The Deepwater Ports Act gives the U.S. Coast Guard responsibility for coordinating the federal role for this development. The process of actually pulling all the strings together in a coherent way took the Coast Guard about a year and a half, but we are now at the point where a deepsea port is being planned, and things are moving along. It will be interesting to look at the various phases of the development and learn from it, and again, to learn what role public participation played in the decision.

The last case, concerning manganese nodule mining and processing, is also a very interesting one with respect to seaward development. It addresses a crucial aspect of manganese nodule mining, that is, where do we process the nodules? We haven't yet mined manganese nodules, although there have been demonstrations that this can be done. Once the actual mining starts, the question of the processing plant becomes a very critical one. First, we must understand what it requires in terms of power, space, resources, water, and so forth. How will we handle the waste products? How does one go about planning such a plant? It will have substantial local impact, which is one dimension of the planning.

Another consideration is, if we don't put the processing plant in the United States, what are we going to do do about the mined nodules? You can phrase it a little differently: How important is the supply of the critical metals in the nodules to our economy, because without this source we may have to depend, with ever increasing frequency, on foreign imports.

These, then, are the basic issues -- though there will undoubtedly be others as the discussion proceeds -- that will be raised in the four cases that we have chosen for this forum on seaward development and citizen participation.

CASE I: OIL AND GAS FROM GEORGES BANK

CASE TEAM

Ira Dyer, Co-Leader
Professor and Head, Department of
Ocean Engineering
Massachusetts Institute of Technology

Don E. Kash, Co-Leader
Chief, Conservation Division
U.S. Geological Survey

Paul L. Kelly
Senior Vice President, Corporate
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Thomas A. Grigalunas
Associate Professor Of Resource
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Gene V. Soccolich
Assistant Director, Resource
Development
Massachusetts Energy Office

Christopher Weld
Executive Director
National Coalition for Marine
Conservation

Richard H. Burroughs
Senior Fellow
Marine Biological Laboratory, Woods
Hole

IRA DYER

Professor and Head, Department of Ocean Engineering
Massachusetts Institute of Technology

INTRODUCTION

I have the privilege of co-leading the case on Georges Bank. I have had approximately twenty years' experience in a private research, consulting, and development firm, and about ten years in the so-called Ivory Tower of the academic world. In many ways, the academic world seems somewhat more grubby than the world of private industry, but that is another story for another Forum.

We have met to discuss Georges Bank, a potential oil and gas development on the Atlantic Outer Continental Shelf. The map in Figure 1 shows the area in relation to the northeastern coast of the United States. It is a case which many people with competing interests can discuss with deep emotion, and we are here to try to understand that, at least to some extent.

More importantly, I think we are here to try to deal with the basic issues underlying this case, not only because this may help us reach some decisions with respect to Georges Bank, although some of us might be in decision-making roles, but perhaps even more to gain an extrapolative understanding of the issues surrounding resource developments in which there are such competing interests.

Now, what are the bare facts of the Georges Bank case? First, there is a potential store of oil and gas on Georges Bank. But there is also a known resource, fisheries, of high economic value. That immediately puts us in a conflict position. By "us," I mean those of who deal with and look at the case.

Second, I would state that taking oil and gas from Georges Bank, assuming that we someday do, will cause the environment to change. I don't think there is any chance of controverting that. But the issue is

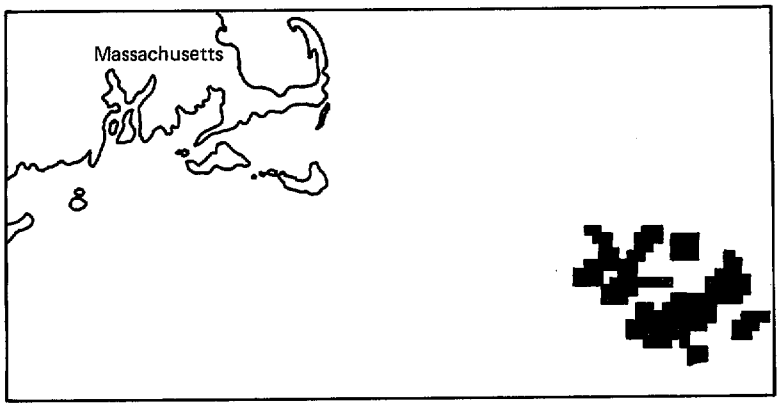

FIGURE 1. Georges Bank area in relation to the coast of New England.

not so much whether we change the environment as whether we have agreement on what the benefits or the disadvantages of that change might be.

The third point seems to be that the entity in charge of Georges Bank -- if we could decide what that entity is, either singly or corporately -- seems to lack a good set of communication links with the various parties that have an interest in Georges Bank, not perhaps through any lack of trying to establish such links, but because the situation is complicated. The number of people with competing interests is very large and the spectrum of issues is wide.

But somehow our expectations are that this entity -- if we could define it -- should act decisively in the face of all these uncertainties. So it seems to me these are the three bare facts of the Georges Bank case, and I have given them in the broad terms so that we might see that there are other cases that have the same underlying difficulties and issues.

The purpose of the Forum, then, is to get at the Georges Bank case, and to make use of the wisdom and criticism of the entire group assembled. We will begin by calling the members of the case team to speak briefly about their interests and their viewpoints.

Paul, I wonder if you could put in context for us, from your industry perspective, the potential of oil and gas on Georges Bank and the energy posture of the U.S.

PAUL L. KELLY

Vice President Corporate Affairs
Zapata Corporation

I am Senior Vice President of Zapata Corporation, a diversified natural resource company based in Houston. Zapata operates a fleet of 18 mobile offshore drilling rigs and some 50 offshore tug supply vessels. We are also active in offshore construction. We are probably unique in that we are the only entity in the world that not only operates in offshore petroleum development, but that has invested heavily in fishing -- approximately $100 million -- and we own and operate some 60 vessels that fish for menhaden, anchovy, and tuna. We have four fish processing plants in the United States, one in Mexico, and one in Costa Rica. At present we are investigating the Georges Bank fishery as a logical area of expansion for our fishing business.

It might be helpful if we could begin by discussing the overall U.S.

energy outlook and try to put Atlantic offshore development in that context. Today we are dependent on foreign imports for some 48 percent of our energy. For this reason, it is industry's view that the U.S. should be examining all the potential new sources of energy that it can find. We need to reduce our dependence on foreign imports because, as we all know, this has had a drastic effect on our balance of payments. During 1977 we spent something like $45 billion on imported oil, and this was really the principal factor in our $27 billion balance of payments deficit that year.

I have a few figures that will put the Atlantic Continental Shelf in context, and maybe Mr. Grigalunas or one of the others would like to narrow in on Georges Bank itself. Today, we have proven reserves of U.S. crude oil of about 30.9 billion barrels. Our domestic gas reserves stand at about 216 trillion cubic feet. Some 22 percent of our total domestic natural gas and about 16 percent of our domestic oil come from offshore operations. That figure should be put in the context of the fact that leases have been sold on only about 5 percent of the total available offshore acreage by the federal government.

Offshore exploration is, to a great extent, a guessing game. Both the U.S. Geological Survey and industry do their best to estimate what reserves may exist, based upon geological and geophysical information. But although our society tends to be scientifically oriented and feels that such matters should be determinable, you never know whether you have any oil or gas reserves until you actually engage in exploratory drilling.

There was a lot of money spent in the eastern Gulf of Mexico, in the Mississippi/Alabama/Florida area. I believe some 10 to 12 dry holes were drilled in that area on the basis of prospects that looked exceedingly optimistic. The jury is still out on Baltimore Canyon, where nine exploratory wells have now been drilled. Eight of those have been dry holes, and one has been a rather modest commercial gas producer. The industry hasn't given up yet, but it obviously is going to take a significant amount of additional drilling in order to define what the prospects there may be.

The estimates of how much of our total oil and gas reserves may be located under the OCS range from 10 to 49 billion barrels. For gas, they range from 42 to 181 trillion cubic feet. Narrowing that to the Atlantic area alone, there are estimates of 2 to 4 billion barrels of oil and 5 to 14 trillion cubic feet of gas. I think those figures probably included Georges Bank and the Baltimore Canyon.

To put that in further perspective, let's say that in those two areas we are looking at a combined figure of 2 to 4 billion barrels of oil. For comparison, the North Slope of Alaska, I believe, has proven reserves of about 10 billion barrels.

If you assume the maximum estimate of 4 billion barrels of oil and project that it would be produced over a fifteen-year period, that could mean about a million barrels of oil a day for the United States. To put that in the context of our daily consumption, I think we are using about 18 to 19 million barrels a day.

I know there are those who feel that those figures don't make the Atlantic OCS potentially significant in terms of our total energy outlook. In response to that, I always make the point that you never know when you may find a really large oil field, and I think it is in our best interest to go ahead and drill the exploration wells and find out what may be there.

THOMAS A. GRIGALUNAS

Associate Professor of Resource Economics
University of Rhode Island

I have been with the University of Rhode Island in the Department of Resource Economics since 1971. During that time, I have studied a variety of marine issues, particularly offshore oil and gas development. A major study that I worked on, through our Sea Grant program, involved looking at the potential onshore impacts of offshore oil and gas. I also was part of a University of Rhode Island team that, through the New England Regional Commission, looked at potential fishing and oil interactions on Georges Bank. I have done a variety of other things in the OCS area.

First, let me further orient you toward Georges Bank. In Figure 2, Cape Cod, Massachusetts, is on the left side of the chart, with the Georges Bank area in the lower righthand corner. It covers approximately 11,000 square miles. When oil companies were asked to submit nominations for sections of Georges Bank, roughly 10 to 11 million acres of Georges Bank, probably two-thirds to three-quarters of the area, were indicated to be of some interest. But it is the very dark areas that indicate the pockets of high petroleum interest. You can see that the area is a considerable distance offshore. If we were to construct a hypothetical circle around the very dark areas, its center point would be approximately 155 miles from the Rhode Island/Massachusetts border and about 85 miles from Cape Cod. However, part of the area is as close as 55 miles to shore.

The Bureau of Land Management has undertaken an environmental impact statement for the areas of high interest. Originally, these included 206 tracks. Some 28 of those tracks were later withdrawn because of an ongoing border conflict with Canada. Roughly one-third of the northeast section of Georges Banks is in dispute, and the fate of the development in the area will certainly be influenced by the outcome.

The resource estimates for Georges Bank, as indicated earlier, are

highly uncertain -- anywhere from 900 million barrels to 2.5 billion barrels of oil -- with something on the order of 4 to 13 trillion cubic feet of natural gas. The higher estimates are given extremely low probabilities, underscoring the uncertainty associated with estimates of oil and gas from any new area like Georges Bank.

Figure 3 shows Cape Cod in the upper lefthand column, with Georges Bank represented by the configuration at the lower right. The various fishing grounds for scallops and the longline grounds and pot grounds are identified in the darkened areas. You can see that there is some overlap with the areas of high oil and gas interest, particularly for scallops and some of the pot grounds.

From interviews with the fishermen in the area, we also know that the yellowtail flounder fishery extends throughout the area of oil and gas interest, as do some other fisheries. Some information on the fishing industry would be useful here. With the passage of the Fisheries Management and Conservation Act of 1976, the industry has been undergoing a major transition. There has also been a substantial increase in the number of vessels and landings. Based on the latest 1977 statistics, reported landings by U.S. vessels from Georges Bank

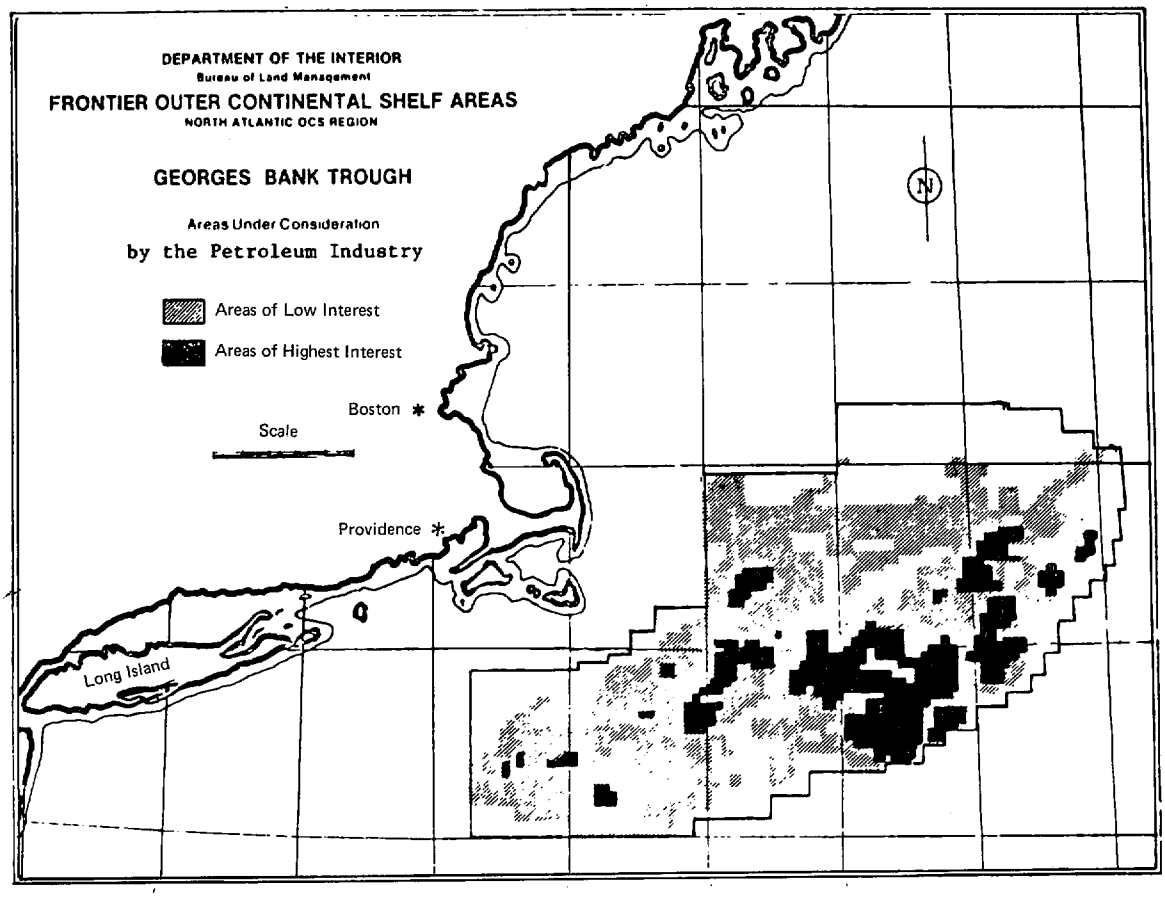

FIGURE 2. Georges Bank, with areas of high petroleum interest.

were on the order of $64 million, involving some 253 million pounds. As the effects of the Fisheries and Management Conservation Act are realized, it is possible that this figure could expand considerably. In fact, there have been some estimates that landings from Georges Bank could annually exceed $100 million if catches by U.S. vessels approach the maximum sustainable yield. There are about 900 commercial fishing vessels in New England. Not all of those fish on Georges Bank, but a good many do, and the number has been increasing sharply because of the conditions set by the new 200-mile limit.

RUSSELL WAYLAND, U.S. Geological Survey, Retired: I have a minor correction. Mr. Kelly said that 48 percent of our energy was imported. I think what he is talking about is oil, not energy.

Another point that needs comment, I think, is that he said maybe 4 or 5 percent of the OCS was leased. I would say that a good deal more than that has been offered from time to time and not leased, simply because it wasn't bid on or didn't receive a high enough bid.

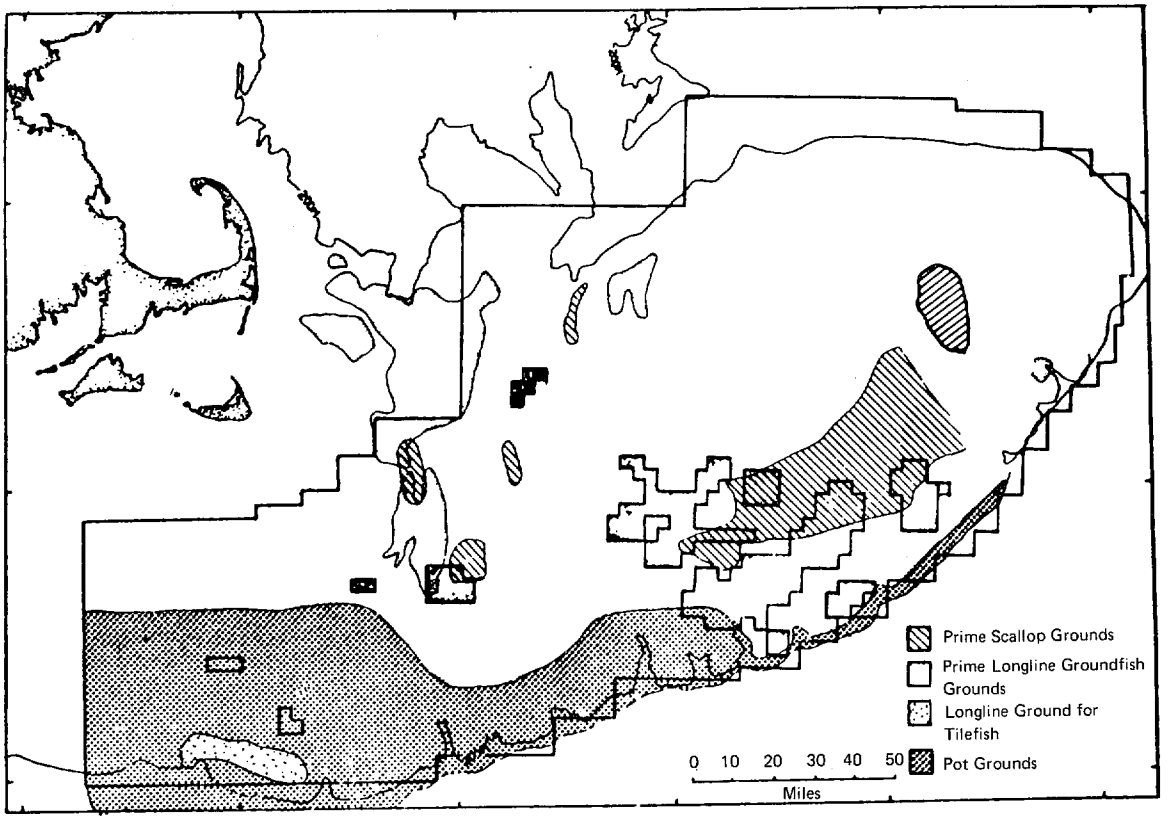

FIGURE 3. Fishing ground on Georges Bank.

B.H. BRITTIN, Ocean Affairs Consultant: Among the primary areas of concern about Georges Bank and its potential development, I think perhaps one of the most significant is our very long-standing dispute with Canada about jurisdiction over the area. It strikes me that as far as public participation is concerned, that issue alone is going to become very heady until it is resolved. Right now, we don't know when that is going to happen. I suspect, though, that it would be a major concern to the oil companies, the oil exploration companies, the environmentalists, and indeed, to the fish folk, too.

GENE V. SOCCOLICH

Assistant Director, Resource Development
Massachusetts Energy Office

I come from a seafaring family, tall ships and all, and have a few degrees in ocean affairs. I came to Massachusetts about four and a half years ago, and am now working for my third governor as advisor on oil issues. Coincidentally, we met just yesterday with the Secretary of Interior because, as most of you know, Massachusetts is involved in a court suit on Georges Bank.

Offshore oil development is a controversial issue, mainly because initially it was a very novel one. Four years ago when Massachusetts literally popped up on the leasing schedule, we joined with California in asking for a delay in the review of the programmatic environmental impact statement because we had only a few weeks and nobody had ever heard of offshore oil.

The state was consistent, for the most part, in supporting the OCS Bill, which passed last September. I also was in favor of that bill, specifically the Fishermen's Compensation Fund, which finally made its way into national legislation. However, I differed with the state after passage of the OCS Bill, because it was my strong opinion that Lease Sale 42 should proceed with the enactment of that bill.

That was also the opinion of former Governor Dukakis, and our new governor, Edward King, is also advocating development. However, the issue has been in court, and we were down here yesterday to talk with the Department of Interior and various federal agencies and people on the Hill to see if we can come to an expedited agreement.

The state is seeking economic development, compatible with the fishing and tourism industries. We believe that this development can be achieved. But there are rules and regulations that the state has said

must first be enforced. The Department of Interior has replied that those regulations are not needed at this juncture in order to have a lease sale and that they will follow the mandates of the law.

Personally, I believe that. I think that you do not necessarily have to have rules and regulations in place, because the law is the law, and rules and regulations cannot be contrary to that law.

CHRISTOPHER WELD

Executive Director
National Coalition for Marine Conservation

The National Coalition for Marine Conservation is a plaintiff in the litigation on Georges Bank, and I disagree with practically everything that Gene Soccolich said. So maybe we have a case of controversy here.

I also disagree with a number of other things I have heard today. We have heard many estimates on what kinds of oil and gas underlie Georges Bank. All the numbers that have come from the Forum panel greatly exceed the estimates printed in the best case in the environmental impact statement, which I think spoke of 513 million barrels of oil to be extracted over twenty years.

With regard to fishing, the latest University of Rhode Island study on the value of the marine fishery resource on Georges Bank estimated a landing value not of $64 million a year -- the 1977 statistics -- but of $1 billion a year, with economic impacts amounting to $4.5 billion a year. This is in spite of a decade of terrific stresses on the resources as a result of overfishing.

Georges Bank is a focal point of the entire North Atlantic ecosystem, and according to some estimates, it produces as much as 15 percent of the world's fish protein. It is a huge year-round spawning ground, involving a great range of commercially valuable species. So we are not talking about snail darters or that kind of thing.

The actual controversy between the fishing industry and the petroleum industry, as I see it, boils down not to whether petroleum development should take place, but whether it should take place before or after the regulations growing out of the Outer Continental Shelf Lands Act Amendments are in place. Obviously, we would like to know now what those regulations are. Without regulations, the act itself is meaningless, and we won't be able to go back after the fact and put a lot of regulations in place without running into rights that have already been vested in the industry.

In any event, these various provisions under the act are central, we

think, to carrying out its philosophy. The provisions particularly requiring implementation through the promulgation of regulations are, we feel, the suspension and cancellation of leases, which is central to the whole power of policing the environmental behavior of the operators on Georges Banks.

We also feel that some kind of regulations have to be promulgated under Section 18, which is the five-year drilling program providing the mechanism by which environmental risk and potential rewards are balanced. We need to get at the very difficult and conflicting purposes of the act: on the one hand, to develop the resources as quickly as possible, and on the other, to protect the interests of the other industries and the national interest.

We take the position, obviously, that the living resources on Georges Bank are every bit as much a strategic asset for the nation as whatever petroleum resources may underlie them.

There are no regulations, I understand, nor is there any funding under the Oil Spill Liability Fund. This is important, because it is the only incentive other than public relations pressure that we can see for the oil companies to increase their oil spill cleanup and containment capability. The wreck of the Argo Merchant demonstrated rather dramatically that there is no open-sea cleanup capability.

We also believe that the regulations under the requirement for the use of the Best Available and Safest Technology should be spelled out before anybody gets out on the Bank. Finally, we believe that the affected states should be consulted about the regulations.

I think Mr. Soccolich said that he had absolute confidence that now that the law was in place, Interior would in fact do what the law requires. Well, in the first place, I am told that in the litigation Interior has taken the position that they don't believe the OCSL Act applies to Georges Bank. You can't have it both ways. In addition, the fact that they have gone ahead with Lease Sale 42 and the last environmental impact statement on the new Baltimore Canyon sale indicates that it is business as usual at Interior. I have found Interior, of all the federal agencies, perhaps the most difficult to deal with because of its fragmentation. There should be a clearly articulated standard that the department can be held to.

STEVEN FRISHMAN, Publisher, The South Jetty: I am a New England expatriot, having been involved with coastal affairs in Texas for about ten years. Mr. Weld, you have given an interesting and intense view of the fishing conflict as you see it. My experience is that it is necessary to look very carefully at the perception of the fisherman in the conflict between oil and gas development and fishing.

WELD: The concerns I hear expressed in the New England Fisheries Steering Committee, which is a broadly representative industry association, involve loss of gear and loss of fishing time because of what they have heard happened in the North Sea as a result of fishing gear snagging stumpage and debris left on the bottom. I think this has

been to some extent addressed by the regulations, and also will be ameliorated by the Fishermen's Gear Fund.

The other concern frequently voiced by New England fishermen is preemption of the fishing ground by platforms and the surrounding safety areas. As I understand it, there will be about a quarter-mile safety area around each platform. Now, there are tremendous currents around Georges Bank, which is another physical factor that distinguishes it from the Gulf of Mexico. The environmental impact statement didn't cover this very thoroughly, but anybody who has fished out in Georges Bank will tell you that there actually is white water out there; there are rips. In full-moon and dark-of-the-moon tides, you can get out there and think you are in the middle of the Bay of Fundy.

This means that if you are towing a net behind a not-very-powerful fishing boat, you have limited maneuverability, so that in order to stay away from these oil rigs, you are going to give up a lot of bottom. This is a primary concern. It may be an exaggerated one, but you won't convince the fishermen of it for a while.

GRIGALUNAS: I want to discuss the figures given for fisheries landings from Georges Bank. The $64 million is a National Marine Fisheries Service statistic for 1977. In the University of Rhode Island report, there was a somewhat higher estimate because an attempt was made to look at what would happen if fisheries stocks were restored under the 200-mile limit, assuming all of the landings were caught by U.S. fishermen. But that figure was nowhere near $1 billion. It was closer to $100 million.

If you look at the activity in terms of even modest resource estimates, however, well within the Bureau of Land Management's published estimates, returns to the nation could be in the billions of dollars net.

There are some conflicts. Some of them have been identified; others will come up and we need to discuss them. I think, though, that it is important to have what facts we do have straight and to look at ways in which we can deal with those conflicts if we want to capture the gains from development.

As far as the Fisheries Fund is concerned, we have worked with the people in the North Sea -- visited them, corresponded with them. There have been fewer than 200 claims over a two-year period, amounting to less than $300,000. This isn't to dismiss that issue as unimportant; it clearly is important to the fishermen affected, and it is important that the legislation has been passed. But it is a matter of perspective.

As far as area preemption is concerned, in our University of Rhode Island study we did a worst-case analysis, assuming an Ekofisk type of development, which is a series of platforms that preclude fishing between them because of the dense development. We assumed all the platforms were of that kind and were placed in the area of the most intense fishing. The reduction in fishing under this worst-case assumption, assuming the fish weren't caught somewhere else -- and fish are mobile -- is that there would be a reduction of less than 5 percent

in landings.

A case can be made for compensation, which is not in the OCS Lands Act. In the North Sea there have been studies on how big the lost catch might be. This figure is elusive, but there is some attempt to seek compensation. However, preemption of fishing areas is not a major factor, not in the MIT study, the study that we did, or any other study that I am aware of.

KELLY: None of us wants to depreciate the national significance of the Georges Bank fishery. But we grew up reading in American history that fishing for many years was the economic mainstay of New England, and it has a tremendous tradition. Because of that, and because it happens to be politically one of the strongest organized fishing groups in the nation, its significance vis-a-vis the other fisheries in the United States tends to be exaggerated.

Georges Bank will not be the first area in which oil and gas operations have been conducted in the middle of significant fishing grounds. Granted, the Georges Bank fishery stands to gain from extended jurisdiction. But the record to date has shown that the landings from that fishery have been behind fisheries in other areas in this country, like the Gulf of Alaska, the California coast, and the Gulf of Mexico, all of which have extensive oil and gas operations.

In the Gulf of Mexico, the fishing industry is much newer. It began in the last quarter century, about the same time as offshore drilling did, and the two industries have grown in parallel. Landings in the Gulf of Mexico are now at the rate of about 404 million tons a year.

There are some differences in terms of currents. I would think, though, that the Gulf of Alaska would have navigation conditions comparable to those in New England. But basically, in other fishing areas it has been shown that offshore oil drilling and fishing can exist compatibly.

The main concern of New England fishermen seems to be gear problems. I think Woods Hole did a study not long ago that showed that the areas actually removed from fishing were quite insignificant. The gear problem ought to be one that the two parties and the federal government can get together and resolve to everybody's satisfaction.

I think, too, that the petroleum industry is certainly sensitive to the special problems relating to the trawls used in the New England fishery, and that everything will be done to minimize damage to gear. The Fishermen's Gear Compensation Fund is helpful in that regard too, under the OCS Lands Act Amendments.

Regarding the OCS Lands Act Amendments, I agree with Gene Soccolich that their adoption has gone a long way toward solving the problems that New England saw with Georges Bank exploration.

One very important point that I think has been overlooked since the adoption of the amendments is that for the first time we have, by statute, a separation of the exploration and development phases of offshore exploration. Prior to the amendments, a single environmental impact statement was generally called for, to be prepared by the Bureau

of Land Management prior to the holding of the lease sale. The new statute provides that in a frontier area prior to the commencement of development there shall be a second environmental impact statement, with opportunity for the public to participate in hearings leading up to the preparation of that statement.

The statistics in offshore exploration show that the exploratory stage is the least risky part of the business. I think that USGS did a very careful study of risk from pollution in the Gulf of Mexico from 1971 to 1975, and they found that over that period during exploratory drilling, there was no spill exceeding 50 barrels in any offshore area. During the same period, there were five blowouts reported in the Gulf, but no oil was lost in any of them. When you consider that there is minimal risk from exploratory drilling and that if production is contemplated we will have a second look, I don't see any reason to hold up the offshore lease sales.

If you look at other situations involving public participation in OCS-leased areas, three that stand out are the Gulf of Alaska Lease Sale, the Tanner Banks Lease Sale in California, and the MAFLA sale in the Eastern Gulf of Mexico. All three lease sales were opposed by environmental and coastal state lawsuits. The oil company bidders spent some $2.4 billion on their bonuses for those sales, and the industry, the environmental groups, and the states spent millions of dollars in litigation costs. The sales were upheld by the courts, and exploratory drilling began. To date, there has not been one commercial producer found in any of those three areas. We have had nothing but a series of dry holes.

I think something we ought to consider is: How much in the way of human and financial resources has been wasted in those cases, when we didn't even know if a drop of oil was to be found in the area?

On Georges Bank, why should we hold up the lease sale, why should we hold up exploratory drilling when the risk is minimal and we will have a chance to look at the risk if we find oil and gas? Why not just go ahead and find out whether anything is there?

E. EDWARD BRUCE, Attorney: I would like to set the record straight, because I have been involved in this litigation on a day-to-day basis.

Sometimes assertions with very uncertain parentage take on a life of their own. One of those is this figure of 15 percent of the world's fish protein that has been referred to as coming from Georges Bank. The fact is that is just an assertion, not attributable to any source.

Judge Garrity, in the opinion he wrote to justify his preliminary injunction, credited that assertion. In the Court of Appeals, we had the time to examine it. Through world fishery data from government sources, we demonstrated that the catches from Georges Bank probably supply well below 1 percent of the world's fish protein.

In terms of asserted legal positions, I would just like to make one point. I think it has been suggested that the oil industry will assert the position that it always has vested rights to do anything that it wants to do, and that the only way you can rein it in is to have in

place a detailed set of regulations prior to the time leases are issued. That is my sense of your point about the need to have the regulations now.

In fact, the industry has always said in these kinds of cases that the government has very, very broad regulatory authority that it can exercise. It has never questioned that. Indeed, it would be silly to question it, because the law is so clear, not just in these cases, but in a whole range of cases involving modern regulatory principles. There aren't any decent constitutional arguments to the contrary.

BRITTIN: I would like to put into broader perspective some of the comments concerning the problems of having oil rigs in a fishing area. It is true that the waters in Georges Bank are rough. In this regard, it might be well to look at the North Sea, where very intensive fishing is carried on by a number of countries right in the same area where there are oil rigs.

I also think it is pertinent that in an area like the Persian Gulf, which has, indeed, a high concentration of oil rigs -- I do not work for an oil company, and I never did -- the second largest industry of Kuwait is fisheries. The productivity of shrimp for the whole Persian Gulf is very high indeed, and the countries that participate in that in the Persian Gulf feel pretty much the same way as the Louisiana Shrimp Association and the Texas Shrimp Association. We have found, through experience, that we live together pretty well. Indeed, in many cases productivity has increased.

RICHARD H. BURROUGHS

Senior Fellow
Marine Biological Laboratory, Woods Hole

My particular interest in our subject is the use of science in making resource management decisions. And with respect to oil development on the Outer Continental Shelf, there is a long history of trying to understand where the oil and gas resources are and how to exploit them economically. In that area, science -- in particular, petroleum geology -- has been involved for a number of years.

Passage of the National Environmental Policy Act has created a new set of concerns, including the use of science in the management of the other resources on the Outer Continental Shelf. There the record is somewhat mixed. I have been involved in looking at how one might

conduct a study program, and in particular how information might be used in decision-making.

The use of science in these kinds of questions is limited to occasionally producing facts and, more frequently, probabilities; its role is never one of resolving values. Ultimately, I think the Georges Bank case is bound up in values, in which of our natural resources there we value the most.

I would first like to produce my set of facts and figures, every panelist having a set. I did the calculations somewhat differently. That is, I assumed that we are in a finite world in which there is only so much oil and so many fish. Fortunately, in the case of fisheries we have a renewable resource which, if properly managed, will produce indefinitely.

I didn't try to convert these values into dollars. What I tried to do is assess how many fish we have today and what kind of undiscovered but recoverable reserves we might expect on Georges Bank.

My calculation was that the Northwest Atlantic fishery was 7 to 10 percent of the world's marine fishery. If you look at the ICNAF data for Georges Bank and the Gulf of Maine, you get that area providing about 1 percent of the world's supply.

By estimating a one-billion-barrel oil find on Georges Bank and comparing that with the National Academy of Sciences 1975 estimate for total world supplies (noting that there are many estimates and that that particular estimate varied by a factor of three), one can determine the importance of the oil resource. If the world's supply is at the low end of the reported variation, Georges Bank oil may account for about one-tenth of one percent of total world supply. So we are off by a factor of 10 in this calculation in terms of the importance of fish versus the importance of oil. But the oil benefits may be realized only once, whereas the fish benefits occur each year. This can be calculated a lot of different ways, using different data sets than the ones I used. Nonetheless, that is one way to think about the problem.

To specifically address the interaction between oil and fish and the extent to which science can provide advice or guidance there, a variety of studies have been done on Georges Bank, but none that I am aware of has looked at the interactions with the biota in quantitative detail. The early MIT work looked primarily at trajectories. The Council on Environmental Quality, in its report of 1974, specifically flagged the fishery and oil interaction, but indicated that it had not addressed it. So the level of information getting into the decision process now with respect to the effect of oil development on fisheries is very low.

People recognize that as a problem, and there are a series of investigations that could be undertaken in that regard, but I would expect quite a bit of time to elapse before unequivocable results would be available.

DON E. KASH

Chief, Conservation Division
U.S. Geological Survey

As an employee of the Conservation Division, I represent one part of this triangle of government, industry, and the public that keeps being referred to. I grew up in a small town in Iowa where no one really thought there was much utility in being a political scientist. When I arrived in town on the way to Washington and it became clear that I was going to be a regulator, the reputation just dropped out completely. So I came to Washington with a certain amount of nervousness about this regulatory function.

I haven't had firsthand involvement in the Georges Bank case, but I think it represents in microcosm the general issues that we as a nation have had to wrestle with concerning OCS oil and gas development.

One issue is that there is an overlay of environmental concern. How much that motivates the differences in this case is a little difficult to sort out. However, since the Santa Barbara oil spill, there has been a widespread perception that oil and gas development negatively impacts the environment. Dr. Burroughs has suggested that factually we don't know much about that impact. The hard data are limited. But that seems to make little difference to public perception.

Second, there are ideological concerns that run through this whole controversy. For instance, if you read the literature and the newspapers, there are some people who participate in this who have ideological concerns about large industry.

Third, there are obviously economic concerns. If I recall correctly, this whole thing first surfaced when the State of Maine proposed selling some leases back in 1969 because they claimed they owned the OCS out to 25 miles off Great Britain through a grant from the King of England, or something of the kind.

If the State of Massachusetts owned Georges Bank, you probably would have a somewhat different mix of issues and players. The issues we are talking about -- whether or not there is a $60 million fishery and how you trade that off against oil and gas development -- depend on the side you stand on with regard to the economics. Economic issues pervade this whole controversy, and they are not just ones between fishermen and the oil industry. They also have to do with federal-state relations.

Finally, there are a whole set of political concerns. If you read the New England press, I get the impression that candidates have sometimes used this issue as an appeal for election purposes, and that in this process state officials come down on opposite sides and it becomes a sort of surrogate for other kinds of struggles.

Georges Bank isn't any different than any other political issue. But there is an element that it points up: It demonstrates some of the problems in making judgments in this society in a condition we can probably characterize as progressively more serious levels of ignorance.

I choose "ignorance" as a loaded word, but I don't mean to make it

pejorative here. What I have been told, first of all, is that we have estimates of certain amounts of oil and gas on Georges Bank. And then I am told that we periodically sell leases, sometimes chunks of leases, for billions of dollars and then can't find anything. Now, it may be that Mobil or Exxon or someone really does that primarily to support their argument about the great capital risk and that they are willing to spend $100 million on a lease to build their case. But that really isn't quite credible to me. The point is that we don't really have any way of identifying oil and gas in advance of drilling out there. If we did, it would change the argument pretty drastically. That is one level of ignorance.

Another level of ignorance is tied up with New England. Here I tread on terribly delicate ground. But though I am told by my colleagues at MIT that one of the great industries in New England is education, there is no petroleum engineering department at MIT, and there is really a good deal of ignorance about the oil industry in New England. It is the same sort of ignorance we had in Iowa, I would say. We didn't know much about oil, except that sometimes people drilled holes and got rich, and they made movies called "Giant" and so on. Part of this is a problem of being comfortable with an activity. I must say that I have always found fish ports very offensive; they smell bad. The oil industry is a sort of foreign commodity in this area.

Finally, there is substantial ignorance about the impacts of oil drilling on fish ecology. Lyle St. Amant of the Louisiana Department of Wildlife and Fisheries has told me over the years that the only hard data he has with regard to the state fishery is that they are bringing more onshore now than they used to.

You are faced with making a decision in the context of tremendously complex issues that are of central importance, with players who are all very sincere. In truth, I share the values of almost every panelist up here. I do a wonderful job as long as I don't have to trade them off, one against the other. And that is precisely what we have to do in this society. How do we do it?

I propose that what this panel is about is trying to figure out how it is that in this society we substitute public participation for what would be much more satisfactorily done with understanding and shared values. We divide responsibility when we have to make decisions about consequences we don't understand in complex systems. To legitimize decisions made in ignorance, we use a process where we bring everybody into the decision, trying to insure that if something goes wrong, most of the players have to be careful about standing up and pointing their finger, and saying, "Damn it, it is your fault."

So public participation, as I see it, is a way to collect and to represent values. But in a sense it is a substitute for what would be better done if we understood the consequences of our actions and had a complete grasp of the data, which I do not believe we have.

GENERAL DISCUSSION

LYLE ST. AMANT, Assistant Secretary, Louisiana Department of Wildlife and Fisheries: I have lived with the oil and fishing industries for too long to count. And I think the most interesting thing I have heard here this morning is that all of you speak the truth. The thing is, you need to put it together. There are several things I may be able to call your attention to, particularly if you bear with me a minute and look at the thing historically.

First, we talked a great deal yesterday about the triangle, with the public and the environment in one corner, the government in another, and industry in the third. But in the early days, you have to realize that the third partner was another industry, a real interest and not a vague, amorphous thing like the environmental movement may be today. The environmental movement may have been a force since 1969 or so, but since 1945 we in Louisiana have been caught between real industries, the fishing industry and the oil industry.

The problems here are much more people and industrial relations problems than they are ecosystem problems. On this point I must agree with Mr. Weld. Regulations should come first, and they should be clear. I don't believe in letting the fox guard the henhouse. I think that the regulations should be laid out and that the people running them should be aware of what the regulations affect and what they are supposed to do.

On the other hand, I agree with the oil companies that the risk from drilling and exploration and even production is minimal. It is really much lower than most people realize. But I submit to the industry, if you don't plan to break the speed limit, you ought not to worry about it being there. All I am saying is, the regulations are not going to keep you from operating, they are going to keep you from operating improperly. I have learned from experience that congressional intents and the regulations that come out of some of the agencies don't always match up. I think that what you have to do is to clearly explain them.

What we are talking about is how to make people operate together. There is a problem with fisheries and oil industries. We have 2,700 to 3,000 platforms off the coast of Louisiana, at least 1,000 of them what you might call large platforms. I agree with the gentleman who said that this is of no significance in a big area, even though it wipes out about one square mile around each platform for a big fishing vessel. Conversely, recreational fishing tends to congregate around these areas, and small boats can get into the system. Fish seem to like the platforms; fishermen don't. The problem is that the fishing industry is an historical industry, concerned about its welfare.

The bottom and gear-snagging problem associated with fishing is a real problem. With all the regulations, if you don't have the proper surveillance and enforcement, people throw things overboard. Even with the best of regulations, it is difficult to keep the sea floor clean. The recent act which allows for some mitigation of this is a good thing, but it is going to be difficult to administer, let's not kid ourselves,

because you have to verify what is on the sea floor before you begin to pay people off. There are a lot of things there that have no relationship whatsoever to the oil companies: ships that were sunk, reefs, things that went overboard accidentally.

It is true that our fish production in Louisiana has shown no variation over the last 35 years. I can conservatively say that if oil, as a toxic substance, could wipe out a fishery or ruin an ecosystem, Louisiana would have been gone before we could spell "environment." There were absolutely no regulations from 1927, when the first oil wells went into operation, until 1950. This was after World War II, when there was a big demand for oil, when they sank 17 tankers off the southwest pass in Louisiana in one week. All this oil accumulated on the beaches. I have seen the times when you were afraid to strike a match in Barataria Bay. Nobody is proud of this. It was a fact of life that came up in a really hostile environment where people weren't present most of the time.

The other thing in favor of the oil companies is that in the early days they took land equipment, which at best was unsophisticated, and tried to move into a hostile marine environment. Some of the rigs and systems were not too reliable. The present system is so sophisticated and well-managed that I have no real concern about accident problems. The occasional accident should be well-contained. I think the evidence shows that where these accidents have occurred, the damage is temporary.

I think that there is a subject we are unfamiliar with: changes in the in-shore areas where there has been a considerable amount of dredging. But here we have to point out that dredging is associated with oil as an industry, not oil as a substance. We have had as much dredging from other sources, navigation and what have you, as from the oil companies. When we began to separate the off-shore from the in-shore problems, the off-shore problems became really minimal.

The question of the effect of minute traces of low levels of oil on marine larvae and eggs has been debated. All I can say is that the fish are still there, and even last year, with some 30,000 oil wells off the coast of Louisiana -- some of them mismanaged, let's be honest about it -- we had the highest production of the years of our fishery that we have records for. We produced over 104 million pounds of shrimp, and I think the gentleman from Zapata will recognize that the menhaden were so plentiful that some fishermen wanted to quit fishing because they couldn't handle them all. I think that to just make assumptions that the fishing and oil can't live together would be incorrect.

KELLY: I believe that Cameron, Louisiana, was the number one fishing port in 1978 in terms of tonnage landed. I don't think the NMFS has the official figures out, but the preliminary figures indicate that.

DYER: Dr. Burroughs, how does the nature of the fishery in the Gulf of Mexico compare to that of the fishery in Georges Bank? More particularly, in the Georges Bank case, what can you say about the statements that we really don't know enough about the nature of the

fishery to make good decisions about it?

BURROUGHS: I thought that one of the bare facts that we agreed on at the outset was that the taking of oil will cause the environment of Georges Bank to change. There is a history of studies that indicate there are certain biological impacts of oil, and I don't think that is disputed any longer. I think what Dr. St. Amant and others have focused on is whether this disruption is significant enough so that the two cannot coexist. Under what circumstances might they coexist?

Regarding Georges Bank, in citing the MIT study and the CEQ study and others, I pointed out that this interaction was not quantified -- nor could it be, I am sorry to say. That means that the public debate goes forward with a signficant missing link. That is where we probably tend to pour in a lot of value judgment about what levels of uncertainty or risk we are willing to accept.

I think right now the public debate is reaching a decision point where these risks will have to be accommodated one way or another, depending on what happens in the courts. The science of it is very unclear. The record demonstrates that oil does cause problems in the environment. It does not demonstrate that one can be 100 percent sure that if you develop oil on Georges Bank you are going to lose the fish there. What we just heard from Louisiana is that the opposite seems to be the case. Whether the Louisiana experience can be extrapolated to Georges Bank is uncertain. My guess is that it would be difficult to do that.

DAVID ALLEN, Oceanographer, Bureau of Land Management: I would like to bring up an issue that I think a Forum such as this -- and the public -- should be considering, and also to pose a question.

The issue is misdirection of public pressure in many cases toward issues of personal prejudice rather than those germane issues that should be faced at the time. The Bureau of Land Management conducts environmental studies in all the development areas. I am speaking as the person responsible for the Georges Bank environmental studies on the effects of oil and gas development on Georges Bank. The issues that these studies address are largely determined by public participation. And despite the optimistic -- I feel -- prognostication of hydrocarbon presence on Georges Bank, the fact remains that they have been drilling on the Scotian shelf since 1961, and they have found nothing commercially exploitable.

At last year's American Association of Petroleum Geologists' meeting in Washington, we listened to paper after paper discussing the fact that there is not the necessary juxtaposition of petroleum source beds with reservoir beds on Georges Bank, and for this reason the geologists doubted there was very much oil. Further, the oil is a very long way offshore, if there is any.

With that background, my question basically is: Since with Georges Bank the public worry is directed primarily at the polluting effects of development rather than exploratory activities, would it not be

economically as well as environmentally sensible to consider deferring onshore and nearshore studies, which we are being pressured into now -- especially socioeconomic studies -- until we know that there is a proved reserve in Georges Bank? And to use our money, which is limited and which has been cut back substantially, for more important studies?

I feel this is a question that a public forum such as this should seriously be thinking about.

COMMANDER PETER CRONK, United States Coast Guard: I have some comments and observations. One is a clarification of the safety zone mentioned previously. The quarter-mile safety zone around oil drilling platforms is not an automatic feature. It is designed to provide a buffer zone in cases where it is needed, where passing vessel traffic might disturb the operation, or in case there may be an emergency aboard the installation making it desirable to keep other vessels away.

I am wondering how much the public really knows about a mobile drilling rig. In drilling activity on the OCS, "rigs" are used to mean almost anything. Yet a mobile drilling unit is really a ship. Internationally it is recognized as a ship, a special-purpose ship. If a marine community realizes that this is a highly sophisticated organization, very much like any seagoing vessel, maybe the prospect of a drilling rig off the shoreline would be a little easier to accept.

If there were a plastic model of the mobile drilling unit, I think it would be a very popular toy, and if there were a TV episode about oil exploration at sea, the public would be more inclined to consider the possibility that maybe this isn't such a bad idea. A mobile drilling unit in itself does not provide any threat to the other activities on the OCS.

Mr. Kelly mentioned that mobile drilling units have been responsible for only a minimum of oil pollution. A mobile rig is a very pollution-free operation. In the Coast Guard, where we investigate oil pollution and other types of casualties, we find that mobile drilling units are a very minor source of pollution, like many other types of ocean vessels.

To put it in perspective, many passing tankers beyond the 50-mile limit are ballast tanks and clean tanks that continuously pump residues of oil into the same waters that you are talking about. I don't know what kind of analysis has been made on this source of pollution, but probably it is the most significant one.

It takes about five years to determine whether you have an oil field worth developing, during which time there is much opportunity for continued public discussion on the issues. I think exploration of the Outer Continental Shelf to find out what our oil resources are, so that that can be equated with the known fish resources, would be highly desirable in resolving future development activities on the OCS, especially since the exploration phase does not significantly contribute to pollution. Further, sufficient regulations now exist to cover these vessels' operations.

A couple of facts might change the perspective a little, if we knew

them here: What is the percentage of the Georges Bank fishing resource in respect to other fishing resources in the United States, instead of the world? What percentage does the estimated oil in Georges Bank represent of that yet to be recovered in the United States? Finally, what effect would a national energy policy have on public awareness and participation?

PRISCILLA WEIL, National Wildlife Federation: My concerns are more the onshore impacts. I would like to see some consideration of how the local economy in New England affects the potential of oil and gas development on Georges Bank. We have talked about concerns related to fisheries, but there are other pressures in New England, I am sure, that will affect this decision.

I would like to know what the institutional mechanisms are through which the various interests are expressed, and whether the panel feels that there is adequate representation of these interests.

I would like to ask Mr. Soccolich whether he feels that there is a level of confidence in the state governments that they adequately represent local concerns. The possible problems here might be exemplified by the autonomy of some of the county and local jurisdictions and the result that this would have in lawsuits.

I would like to know whether he feels that the developmental EIS will provide information that is adequate to the states' needs. Mr. Kelly said that he felt this does answer the states' needs. I would like to have some comment from the state representation as to what they think the developmental EIS will do for them.

SOCCOLICH: Figures on the onshore impact in terms of employment go from a few hundred jobs all the way up to 19,000. First, it depends mostly on the size of the resource. I think that some people here have put it in perspective, in that this is not the North Sea or the Gulf of Mexico.

The geologic structures that exist offshore cannot hold 10 to 20 billion barrels of oil. The indication so far is that there might be a better potential for natural gas. What would that do for us? We would have gas processing plants in southeastern New England, which would also be a price break for the New England consumer. If there is oil, I would think it would be transported, in the absence of a refinery in the region, down to the mid-Atlantic states.

The Argo Merchant case was brought up, illustrating how people attach oil spills to offshore drilling. However, most of the hydrocarbons in the ocean come from automobile exhausts and the oil spills from tankers. Only a small percentage can be attributed to offshore development.

On the question of risk, it seems there is less than a fifty-fifty chance that commercial quantities of anything will be found off Georges Bank, if you look historically at the oil industry's rate of success in oil exploration. You multiply that times the risk of a spill. Then you multiply that figure times the risk of a spill during a certain time of year. Multiply that times the risk of the spill affecting a biological

quantity. You can see how your risk factor starts to diminish substantially.

Back to the onshore impact of developing Georges Bank, I don't believe there will be 19,000 jobs. Certainly this is not going to change the economic posture of New England. It will be, possibly significantly, an economic boon to certain coastal localities. There are townships who welcome the development of onshore industries for offshore oil development.

To get to another of your questions, whether the state has a competency in addressing local concerns, I will use the New Bedford example by saying that that town was in disagreement with the state with regard to the state's initiating a lawsuit, or even asking for a delay in the lease sale. The state's position was that it also had to look after the interests of the Cape and the fishing industry itself. But New Bedford's position was indeed considered.

We must understand that there is no reason why fisherman should want offshore oil. Yet I believe the fishermen must also understand that they do not own the ocean. There are multiple uses of the ocean.

If one looks at the workings of the federal government, it has been very slow in coming up with the necessary regulations as mandated by the law. But I do not believe that the regulations will deviate from the mandates of the law, or else they will be plainly illegal, and broached as such.

I believe that there is an unjustified distrust with regard to the so-called new federalism, meaning, does the federal government necessarily look out after the interests of specific regions? This brings me to the overall topic of the day, which is public participation.

Public participation, I believe, wherever it occurs in the decision-making process without an adequate understanding of the issues, is going to create the kind of controversy that we are discussing here today. So I believe with Don Kash that you must have the understanding. But public participation is generally at the local level. The locals then work with the state government. The state then works with the federal government, and everybody works with the Congress. To involve everybody in every single step, I believe, is largely a waste of time.

KELLY: I have some figures here that I noted in a report of the National Academy of Sciences, published in 1975, which examined and broke down all the causes of oil spills in the ocean. They are as follows: offshore petroleum production is responsible for 1.3 percent of all the oil that is spilled into the ocean; natural seeps are responsible for 9.8 percent; tankers and tanker operations are responsible for 34.9 percent; atmospheric precipitation -- and this relates to the automobile pollution that Mr. Soccolich talked about -- 9.8 percent; urban and river runoff is responsible for 31.1 percent; and municipal and industrial activities are responsible for 13.1 percent. So when you look at the total ocean pollution from offshore production, it is 1.13 percent, which is pretty minuscule compared to all these

other sources. And yet it is very interesting that we have -- as in the Georges Bank case -- this great public concern over the risk. And if you look at these other activities, we do not seem to have the same degree of public concern. The question of risk may be less related to total spillage and more to the amount per incident.

I think this is an excellent example of where -- at least from my perception of what we know and don't know about the environmental effects -- we haven't sorted out whether or not it is the total integrated spill per annum, say, versus the amount of the individual spill that is more crucial.

WELD: So far, we seem to be talking about oil spill risks limited to exploration and development, and only in terms of what the platforms themselves produce. But there is another tremendous element of risk created by the fact that what the platforms produce must be brought ashore.

Now, if you don't have enormous quantities of oil on Georges Bank, you are not going to have pipelines. That means that you are going to have some form of barge or tanker transport. I think there are estimates that even in the case of a relatively modest find you are going to double the amount of traffic in the Georges Bank area. The Ambrose Light-Nantucket shipping channel is one of the most traveled ocean traffic lanes in the world. If you put across these existing traffic patterns the traffic required to transport the oil from the platforms to New Jersey or wherever it is going, you will double that traffic.

Among all this traffic there is a very substantial fishing fleet, composed of both foreign and domestic vessels. And the position of this fleet at any given time of year is not altogether predictable. You overlay this mess of vessels swarming out there with some of the worst weather in the world -- fog, storms, blizzards -- and the current that I have already alluded to. And then you add some gypsy vessels, underequipped, badly-manned vessels that may be going out to commit some kind of an insurance fraud, like the Argo Merchant, the Crown Zenith, and other disasters that have occurred out there in the last couple of years, and you get kind of a nightmare.

It is in part created by the difficulty in getting the federal government to deal with the situation. There are so many agencies involved, and their responsibilities are so diverse, that it is hard to get a decision as to how you are even going to address this problem. Can you route the major traffic out around Georges Bank? That seems like a simple solution to a civilian like me, but once you raise it with the Coast Guard, the Association of Master Mariners, the Corps of Engineers, and all the other agencies involved in this kind of decision, it is no longer simple.

In addition to the problem of transporting the oil from the rig to land, there is a further problem which creates excellent opportunities for chronic and even major spills: Getting the oil up from the bottom into some kind of a holding barge, from the barge to the tanker, and

then offloading it. This is where your incidence of spills is going to go way, way up.

DYER: It is very difficult to decide what that really means to our society. You characterize it as a nightmare; others would characterize it as a problem that can be resolved.

GRIGALUNAS: I would like to comment on two points Mr. Weld made. One is that there will be some navigational problems because of the increased traffic, both with the additional fishing vessels as a result of extended jurisdiction and because of oil-related traffic. There have been some very unfortunate incidents in New England recently, and there could be a higher occurrence of these with additional traffic. I think that has to be recognized.

On the other hand, it is important to point out that if we don't have development of oil and natural gas resources in Georges Bank, the alternative will be more imports, and more tankers from other countries, and you will have spillage there. We have to consider the difference between what would happen if we develop Georges Bank and what will happen if we have imports instead.

KELLY: Add to that that the tankers used to transport any oil found in Georges Bank would be U.S. flag equipment, subject to higher standards and much closer scrutiny by the Coast Guard. I would venture to say that they would probably replace, in supplanting imports, a much higher number of unsafe foreign flag tankers of the Argo Merchant type.

WELD: Doesn't that presuppose a level of demand? Isn't your demand going to go up all the time, so that you would really be adding Georges Bank traffic to the same or greater import traffic?

KELLY: Well, it assumes imports will continue to go up, and that is what we are trying to keep in check. But I am not sure that that is necessarily the case.

BRUCE: I would like to generalize on the discussion. No one in this room would deny that we have less than complete information or scientific knowledge about what is going to happen in a complex region of the world, be it Georges Bank, the Gulf of Alaska, or anyplace else. I have enough faith in the scientific method to assume that in 10 years or so we will have more information. It may not be meaningfully more, it may be mainly incremental, but we will know something more. And there is a natural tendency, I think, to look at a situation like that and say, "Well, let's wait and learn a little more. Let's get a little more information about the fishery impact and about what is really out there."

The fallacy in that point of view is that it assumes a static world and that it focuses too narrowly upon one particular problem -- oil in Georges Bank -- and doesn't begin to look beyond to the ramifications

that nonaction in Georges Bank has. If we don't produce oil in Georges Bank -- if there is any there -- then we have got to do other things: import more oil; liquefy natural gas in Algeria and try to bring that in in LNG tankers, which isn't easy; produce more coal; or cut down our consumption of hydrocarbons.

It seems to me that those who argue for no-action in the limited context of Georges Bank have a certain burden of proof, too. It seems to me they must begin to focus on what is happening in the rest of the world and really decide whether nonaction in Georges Bank is worth the impact it is creating elsewhere. Coal is a terribly disruptive process on land, as everyone knows, with the slurry pipeline and the things that that involves. And we have talked about the impact of oil imports.

But it is also disruptive not to have energy in a society that is geared to high energy consumption. The point I am making is that you can't simply say "Let's just wait until we know more," because the world doesn't wait. The more intensively you try to focus on these concerns, the less I am afraid you are going to be able to get any definitive answers over time.

BURROUGHS: I hope I indicated that I thought the decision was going to be made by the courts in the face of a lot of outstanding uncertainty. I did not mean that one should wait to resolve all the outstanding scientific issues. That is a dilemma that I am very much aware of.

I would say that the scientific method, if there is one, can lead us to greater levels of knowledge through increasingly sophisticated questions as we try to learn about the environment. We answer one question and become aware of three or four more.

The government-industry-public triangle we have been talking about has a series of management decisions forced upon it that are clearly in a different time frame from the academic or research time frame. I hope what I communicated was that we have to recognize that there are very large uncertainties, and I think the decision process, whatever it may be, should speak forthrightly about what those uncertainties are.

KASH: I have a sense that far too much of the discussion this morning has focused on oil spills, which seem to me to represent a characteristic of this society, so we are arguing about facts. You will spill more oil if you use foreign flag ships, offshore oil produces one percent of the spills, tankers produce 30 percent, and cars put 9 percent in the air. Those are convenient things to argue about.

Obviously, this controversy is tied up with a lot of other issues, and oil spills, I think, are really a surrogate for all the conflicting values.

I think we are making some progress on Georges Bank, and the positions of the different parties seem to be changing. The fishermen find it more palatable now because there is something called the Fishermen Contingency Fund. And there is a Shoreline Contingency Fund.

I have a sense that those funds are to compensate potentially

interested parties, and that some of that compensation may take place without the most compelling evidence of hard damage. I think it probably has some characteristics of distributing resources to interests to get them on board.

Other issues play a role in this. A lady here asked about local interests. Sitting in the Conservation Division, I sometimes get the notion that people don't have as much faith in my good judgment, motives, and ability to do good works as I wish they had. That reflects their view that the federal government doesn't represent their interests.

The interesting thing is that I am also told by local governments that they don't like their states representing them. As a matter of fact, the states do have their own axes to grind. One of the issues that runs through this whole process is that we in the U.S. Geological Survey are trying to deliver information to the states in substantial quantities. We are legislatively mandated to do it. And the Secretary and the OCS Lands Act both tell us that we have got to bring the states and the local communities into the loop. I think there is a power argument about who gets to participate and who gets to decide. All those issues play a role.

Someone made some comments about the urgency or lack of urgency in getting our regulations out, and this is particularly sensitive to me because I have felt some heat on this issue. The OCS Lands Act Amendments are really quite a complex piece of legislation. They are another one of these lawyers' contingency funds, as nearly as I can tell; they offer multiple opportunities for getting legal counsel. Every engineer has to get involved and at every meeting I go to, the Act is pulled out.

It has been pointed out here that sometimes regulations don't represent the legislative intent. I agree with that. But I think in this case we are going to come pretty close. We have had an awful lot of people watching, and a congressional committee is going to be set up for the sole purpose of monitoring it.

Years ago, one of your colleagues at MIT published a paper in Science Magazine that made, I thought, a pretty persuasive case. It said that when people and interests exist who believe that new developments will impact them, and they don't know whether they will be impacted positively or negatively, they tend to do nothing. Only those people who can identify a positive benefit tend to be in favor of it when conditions are uncertain. I think that is exactly what has happened with Georges Bank. But we are working out the procedures and getting the data together, and one of these days we are probably going to get that sale pulled off, if we are lucky enough to find some oil and gas out there. But it is a time-consuming process in a condition of uncertainty, with lots of conflicting interests.

KELLY: A recurrent theme of this Forum is the number of issues and complexities and differing interest groups. How do we handle this from a procedural standpoint? I think Mr. Bruce made a very good argument

earlier that policy should not be made in the courts, but should be delegated, as it is by Congress in this case, largely to the Secretary of Interior.

In this whole process, there are lots of opportunities for public participation. I don't see any real changes that are necessary from a procedural standpoint. In a frontier area like the Georges Bank, there is first a lease sale. There is an environmental impact statement hearing held prior to the holding of the lease sale, and it is absolutely open to every citizen who wants to participate.

In the development of frontier areas, there will be another environmental impact statement on the production phase if oil or gas is found. Here again, there will be an opportunity for the public to participate to whatever extent they wish as individuals.

Now, in between those two events there are also the exploration and -- if oil or gas is found -- production plans that will be submitted to the Bureau of Land Management by the oil company operators. Under the new OCS Lands Act Amendments, these are going to be passed along to the state governors for coastal zone management impact review and comment, and also to the Federal Coastal Zone Management Office. Here we have another indirect opportunity for the public to participate, this time through their states. Congress, in its wisdom, thought that was one area where communication from localities had to be funneled through the state in order to have one unified response.

So I think there are adequate opportunities at the present time for the public to participate, but that what we need to see more of is various interest groups living with the decision that is made -- in this case by the Secretary of Interior, who, by necessity, has to balance all these conflicting interests.

I hope in the future there will be less second-guessing of the Secretary after the balancing act is accomplished. In a lot of this litigation, we have parties who have an axe to grind because they didn't like the way that their interest was balanced. So they come back later in the courts to try to get a little more than they were able to get through the administrative procedure. Hopefully, better education of the public on these issues will result in less of that and in more willingness to live with some pretty decent procedures that already provide for participation by the public.

BURROUGHS: Could I make one brief comment? In trying to assess public participation with respect to Georges Bank, I looked at the final environmental impact statement, and in the back of it there is information that enables you to determine the participation categories. If you define the public as private citizens, he or she was represented through that process, in terms of the aggregate number of responses, only 5 percent of the time. In other words, 95 percent of the respondents to that process could be identified with some group, be it county government, industry, fisheries, scientists, or whatever.

KELLY: I neglected to mention that as many of the individual

regulations are issued, there will also be opportunity for public hearings. For example, the Coast Guard has just held two public hearings on Title III, the Offshore Oil Pollution Liability and Compensation Fund provisions. One was held in New Orleans and one in Washington.

DYER: It seems to me that the best way for the oil and gas industry to decrease the probability of judicial remedy after the fact is to have the industry police itself, to do just a first-class job, even more so than it has in the past. What about the best and safest technology that may be available to the oil and gas industry?

KELLY: The technology in the exploratory phase of offshore exploration is already pretty advanced. I could include many illustrations, but a few will make the point.

Figure 4 shows a semisubmersible mobile offshore drilling platform of the type that will be used in the Georges Bank and that is presently being used in the Baltimore Canyon area. Dr. Craven talked about the American contribution to marine technology through the development of semisubmersible platforms, but he was really emphasizing these platforms as a means of transporting people. To date, the semisubmersible design concept has been developed largely for mobile offshore drilling operations.

Basically, you have a fixed platform that is riding on two submersed pontoons. In effect, they are sitting on two sponsons that are riding on two submarines. Through very sophisticated ballast control systems, the depth of the pontoons can be adjusted to various sea conditions. Because of the spaces between the sponsons, ocean waves are able, in effect, to flow through the platform to minimize motion during drilling operations. This creates a fairly stable platform for drilling, as well as one on which people can live without getting seasick and lead a pretty normal life.

These semisubmersible units also contain sophisticated motion compensation equipment.

The unit in Figure 4 has eight anchors and can remain moored in waves of up to 75 feet. It can continue drilling with ocean waves of up to 40 feet flowing through it.

Figure 5 pictures a jackup type of mobile offshore drilling unit which, instead of floating like the previous unit, actually stands on its legs on the ocean floor. This particular unit is standing in the North Sea in about 350 feet of water, and from the bottom of the legs to the top of the drilling tower, that is the equivalent of about a 40-story office building.

The third major type of offshore drilling unit, shown in Figure 6, is the ship-shaped drilling unit, which isn't used to a great extent in the United States, although one has been drilling the Exxon wells in the Baltimore Canyon. It is particularly useful in extremely deep water conditions and in areas of the world where the drill sites are far from land. Being a ship, it has a great deal of cargo capacity and can carry

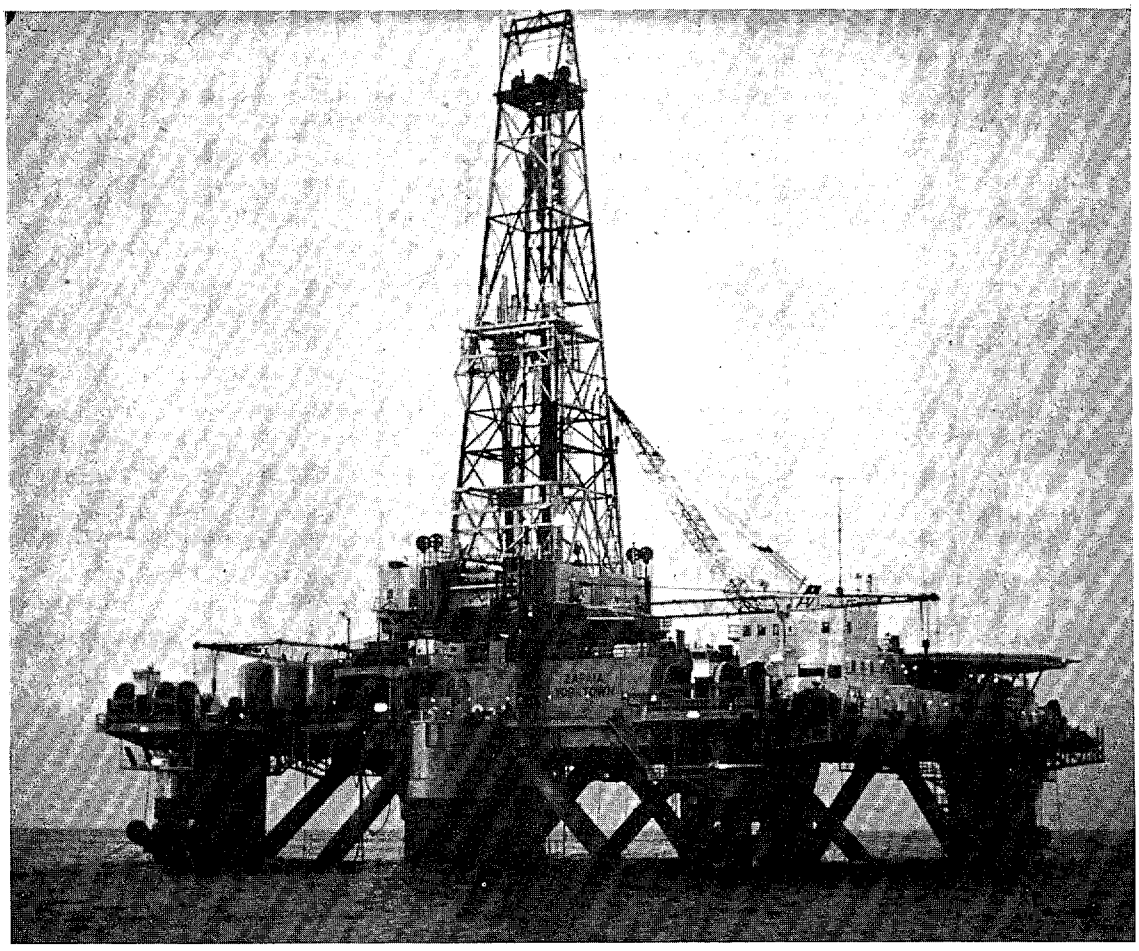

FIGURE 4. Semisubmersible rigs like the Zapata Yorktown are capable of drilling 25,000-foot wells in water depths to 2,000 feet. The rigs have been designed to operate in moderate-environment areas along the Outer Continental Shelf.

a lot of supplies used in the drilling process.

The real purpose of these illustrations is to discuss the concept of best available and safest technology, which has become quite a buzz word of the environmental interest groups. One theme of the Forum has been the tremendously large amounts of capital required for offshore development. The semisubmersible drilling rig in Figure 4 now costs anywhere from $35 to $60 million to construct. For investors to be able to justify an investment like this, they have to be able to see enough income being generated by the unit to make the investment a viable alternative to putting the money in a time deposit account.

One of the paradoxes here is that whereas environmental interests want to see best available and safest technology, the delays caused by litigation in the courts and the time required for the issuance of

regulations, and the various delays provided in the OCS Lands Act Amendments, discourage the development of such technology. Companies just won't be willing to allocate money for this type of investment in the context of other safer investments that they might make.

GRIGALUNAS: I would like to answer that. I am not sure that within the concept of the best and safest technology it makes much sense.

First, with regard to the best technology, you could invest millions more dollars and always develop something better. So what do you mean by "best?"

Second, I don't think the regulators should be involved in the details of what technology companies should adopt as a general rule. If the society has certain goals, such as that so many parts per million should be discharged, then the government should establish general rules (which presumably are justified on economic grounds) and let the

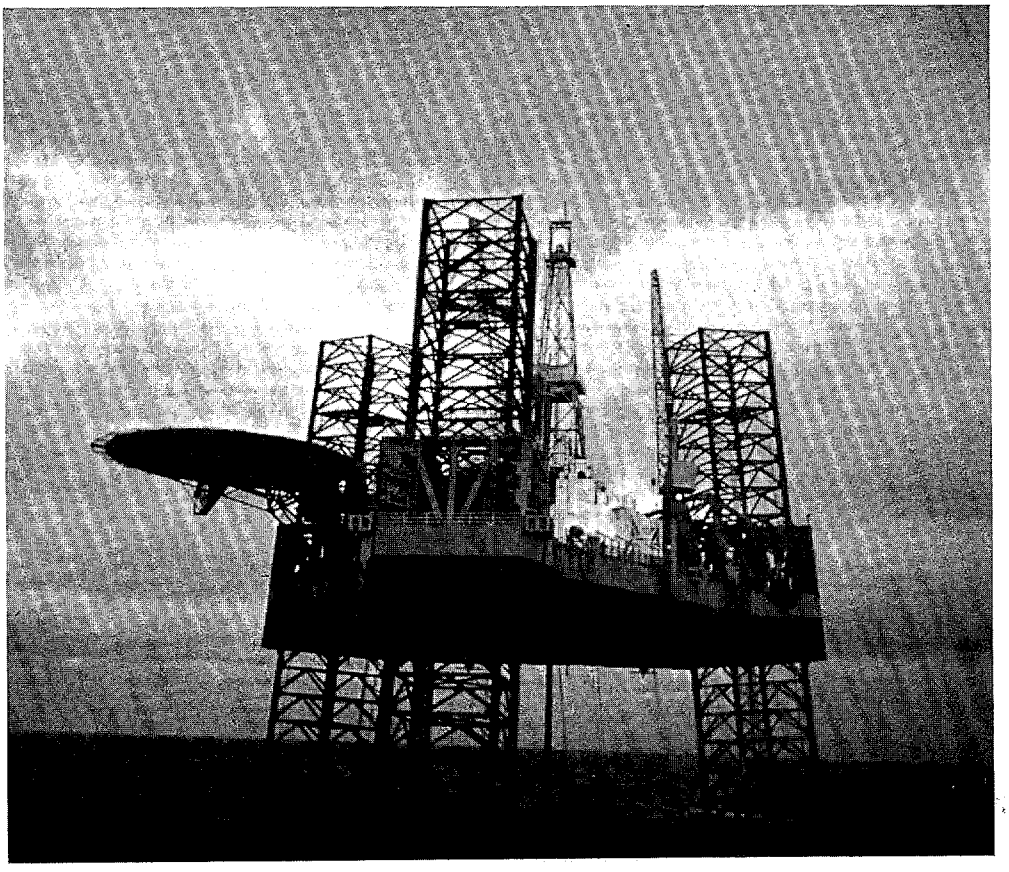

FIGURE 5. The Zapata Nordic, a jackup drilling rig, rests on three 440-foot legs which reach to the ocean floor. The rig can drill in 300-foot water depths in areas with severe environments.

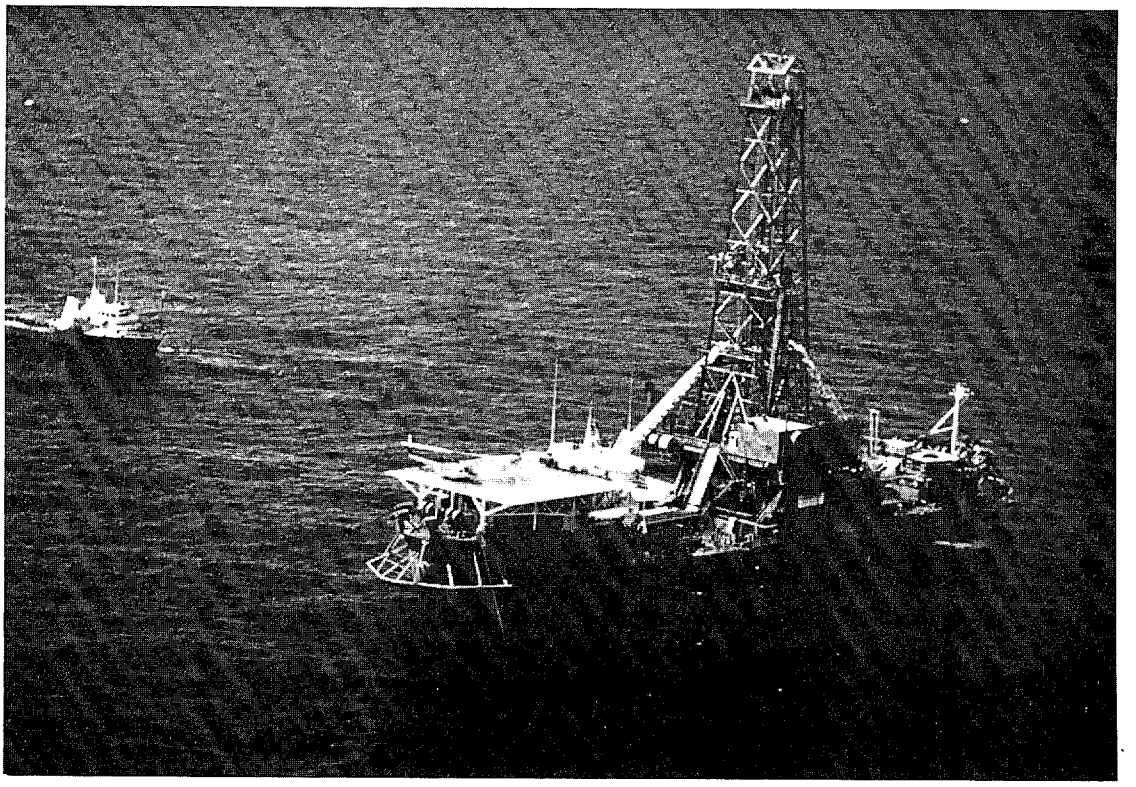

FIGURE 6. Drillships like the 430-foot Zapata Trader can drill in water depths to 600 feet and can travel unassisted between drillsites at a speed of 11 knots.

companies decide the best way to do it. As long as the company meets the regulation and you can have periodic inspections, then why should we care whether it is technology X, Y, or Z?

WILLIAM HYMES, Congressional Research Service: That language is, of course, in the legislation, and it is tied to the pollution question, the safety question. If you read the legislation, you will find some clues as to why the language "best available technology" is used. So it is not a matter of choice.

DYER: Is there any difference between regulating the technology or stating the objectives of what that technology ought to accomplish? Do you think that the law will be blind to that differentiation?

GRIGALUNAS: You are going to have to have someone decide what the best technology is. There is going to have to be a committee to decide that. It is going to be a very costly, cumbersome thing to enforce, and I don't see the need for it. If you can set the standard, why do you care what the technology is?

HYMES: I think that is what they are trying to do, to get at some way of saying what the standard should be.

SOCCOLICH: I believe the most controversial issue on this point is the decision on how oil or gas should come ashore, either via pipeline or tanker. If it is determined to be economically and technically feasible for the oil to be brought ashore by pipeline, what is economically feasible, what is technically feasible? Those terms have not been defined specifically with regard to the national interest.

WAYLAND: Regarding the technical aspects of actual drilling in oilfield operations, whether they are onshore or offshore, the Outer Continental Shelf Lands Act Amendments did provide for this best available technology. The resulting regulations probably will not greatly change the oilfield technical operation. The old regulations -- and I think the new ones -- provide that the oil and gas supervisors of the Conservation Division of the Geological Survey will have the authority to make that decision, but they will be subject to challenge. As to the extent that they may be challenged, it will be a technological case which, if it winds up in the courts, will be subjected to the problems we have been discussing in this Forum.

But the flexibility of the supervisors to issue orders which are publicly reviewed, I feel, is the safeguard that the best available technology will be used in oilfield operations offshore in the future, as they have been in the past.

WELD: I would like to restate my position, which I take to be the position of the fishing industry as well as the conservation community, because I think it is being demonstrated by this discussion of what best available technology should or should not mean. This is one of the reasons why we feel these regulations should be in place before you go ahead with exploration and development.

Not only do we feel that these disagreements have to be settled and the decision made as to what these regulations mean, what shape they should take, how you apply for compensation, or how you decide what kind of equipment belongs on the rig, but we believe that ought to be decided up front.

More basically, I don't understand the willingness of a number of people here to assure me that we really shouldn't be worrying about these things, because Interior in its all-knowing benevolence is going to take care of it sooner or later, when Interior is arguing with us that they may not even be subject to the OCS Amendments as far as the activities on Georges Bank are concerned.

CASE II: SOHIO AT LONG BEACH

CASE TEAM

Russell R. O'Neill, Leader
Dean of the School of Engineering
and Applied Science
University of California,
Los Angeles

Donald B. Bright
Environmental and coastal management
consultant
Former Director of Commerce
Port of Long Beach

William Ahern
Energy Coordinator
California Coastal Commission

Frank E. Mosier
Senior Vice President
Supply and Transportation
Standard Oil Company (Ohio)

Jan Smutny-Jones
Chairman
Citizens' Task Force on SOHIO

RUSSELL R. O'NEILL

Dean, School of Engineering and Applied Science
University of California, Los Angeles

INTRODUCTION

Good morning. I am Russ O'Neill, leader of this panel and chairman of the Maritime Transportation Research Board, a unit of the National Research Council.

When Congress passed the Trans-Alaskan Oil Pipeline Act on November 16, 1973, it opened the way for Alyeska, a consortium of oil companies, to build an 800-mile pipeline from the North Slope oil fields at Prudhoe Bay to Valdez. It was first thought that the West Coast refineries could consume all of the 1.2 billion barrels per day of oil that would flow through this pipeline, but it soon became obvious that they could not handle this much oil. Further, Standard Oil of Ohio (SOHIO), which has the major interest in the Alaskan Prudhoe Bay oil field, has its market in the Midwest. Currently, the West Coast has an oversupply of approximately half a million barrels of oil per day, and it's expected that this might be over three-quarters of a million barrels by 1982.

SOHIO has proposed a distribution system that includes the construction of a new oil terminal at the entrance to the Port of Long Beach, California, the construction of 120 miles of new pipeline, the takeover of 910 miles of existing gas pipeline, and the construction of some temporary storage tanks, in order to transfer half-a- million barrels per day to Midland, Texas, 1000 miles away. The map in Figure 1 shows this proposed system, including the tanker route from Valdez to Long Beach.

This proposal was selected as one of the cases for this Academy Forum because it has created considerable controversy among the citizens. Their objections include the hazard to the environment, both the coastal region and the air, and the possible curtailment of future natural gas deliveries to California. The permitting process for a project of this magnitude is quite extensive; it involves many different agencies at the local, state, and federal level and provides for considerable citizen participation. The proposal is for a fairly large, complex system to supply energy to the United States.

Long Beach is one of the twenty busiest ports in the world today. The aerial photograph in Figure 2 shows its extensive facilities.

It serves about 500 ships a month, including 120 tankers. To put the SOHIO Project into perspective, about 12 to 16 tankers per month would be involved. To handle these ships, SOHIO proposes to build a terminal in the outer harbor near the harbor entrance at Pier J. This facility would have two tanker berths, a breakwater, and some temporary storage tanks. The artist's rendering in Figure 3 shows it as it would appear from an aerial view.

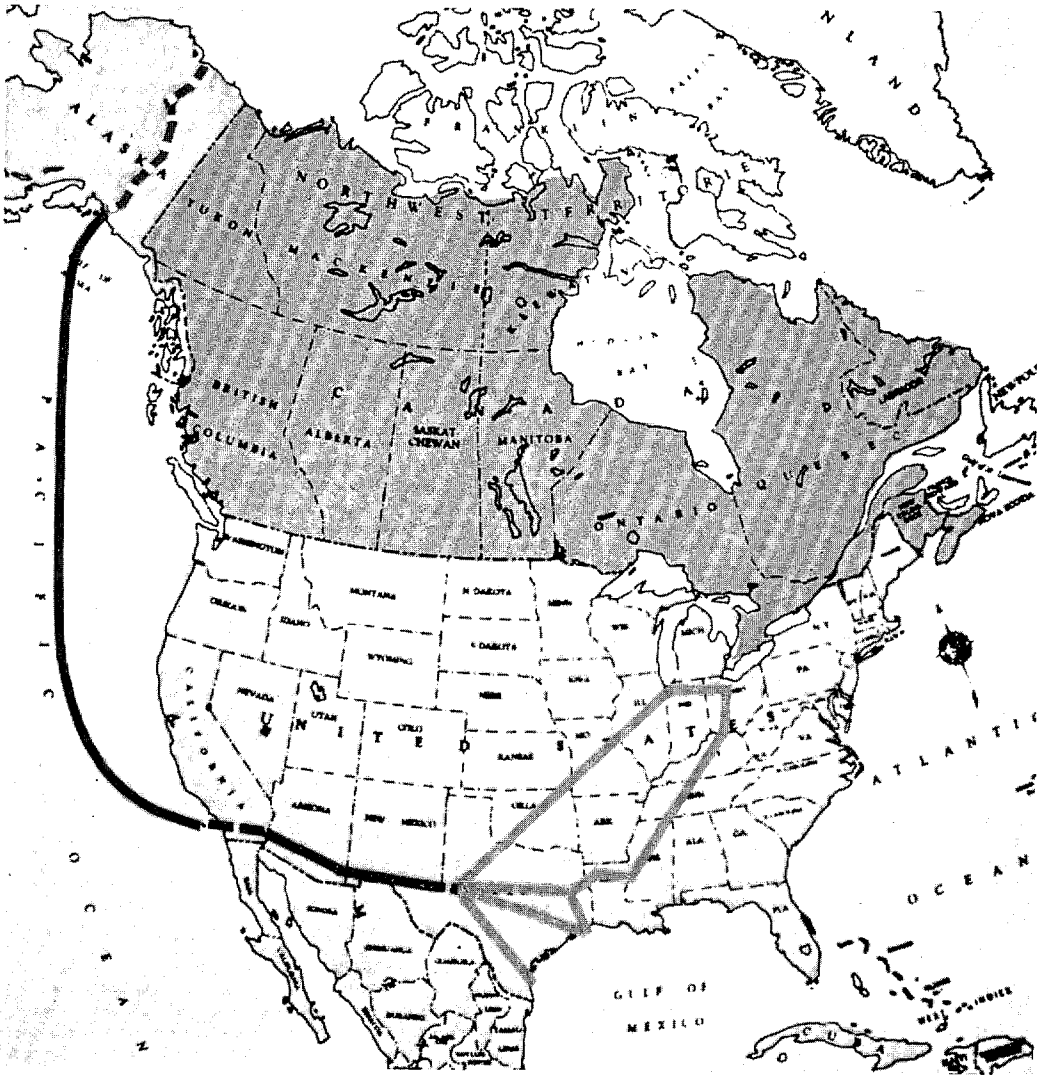

FIGURE 1. Route of Alaska pipeline oil from source to refinery, showing proposed distribution route.

The oil would then be piped to Midland, Texas through a pipeline a little over 1000 miles long. Part of this pipeline would be new construction, about 120 miles. Most of it would be pipe already in place, owned by Southern California Gas and El Paso Natural Gas and put there to deliver natural gas from Texas to California.

SOHIO has already proposed two trade-offs to offset the hydrocarbon emissions that would be caused by the tanker-unloading operations and by the storage tanks: the installation of a sulfur dioxide scrubber at the Southern California Edison Power Plant at Seal Beach, which is nearby, and the installation of some hydrocarbon vapor control equipment at three large drycleaning plants in Long Beach.

FIGURE 2. Aerial view of Long Beach Harbor.

At present, the oil is being shipped by tanker through the Panama Canal, at an additional cost of about $2.70 per barrel.

The SOHIO Project is a very complicated case study, involving a large amount of money and the kinds of tensions that arise when resources that are owned by the public are regulated by the government and developed by private enterprise.

To lead this discussion, a panel of very knowledgeable individuals will expand somewhat on my introduction and then engage in a dialogue with each other and with you. Each panelist will make a few introductory remarks. But first, let me tell you about each of them. Bill Ahern is Chief of the Energy and Ocean Resources Division for the California Coastal Commission. Don Bright is an environmental and coastal zone management specialist; when the SOHIO project was initiated, he was Director of Environmental Affairs and Director of Commerce for the Port of Long Beach. Frank Mosier is the Senior Vice

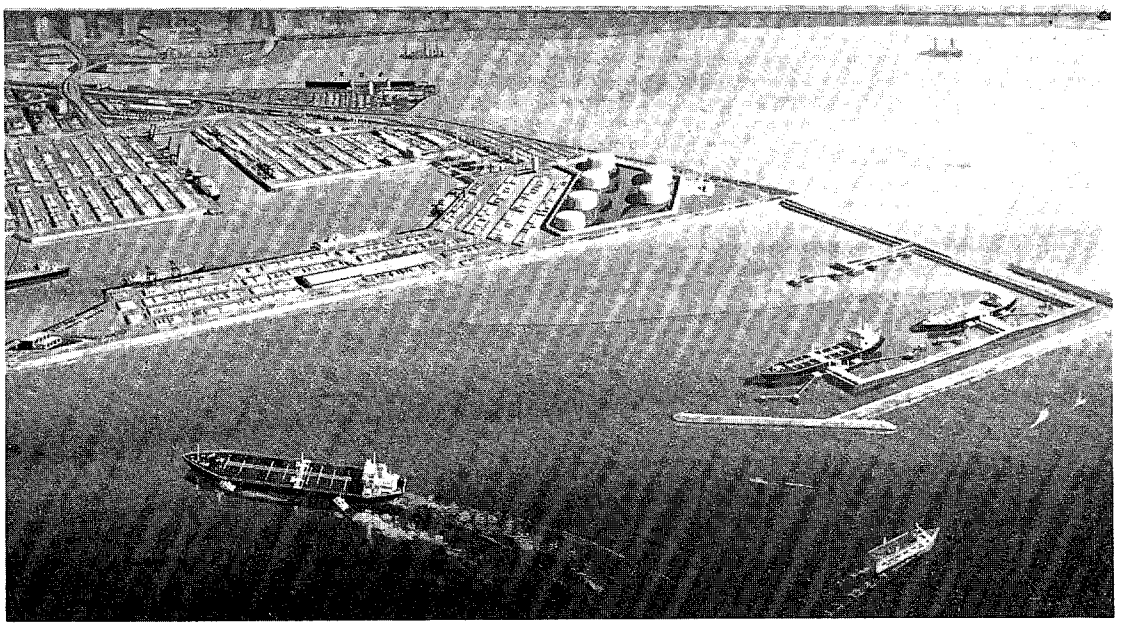

FIGURE 3. Artist's rendering of proposed SOHIO facility with two tankers at discharge pier.

President for Supply and Transportation of the Standard Oil Company of Ohio; and Jan Smutny-Jones is Chairman of the Citizens' Task Force Against the SOHIO Project.

Our first speaker will be Don Bright. Looking at him, you would think he was a sea captain from New Bedford, but he's a Ph.D. in marine biology from USC, and he has been Professor and Chairman of the Department of Biological Sciences at Cal State University, Fullerton, as well as Chairman of the South Coast Regional Coastal Commission.

DONALD B. BRIGHT

Environmental and coastal management consultant
Former Director of Commerce, Port of Long Beach

The SOHIO Project, from an engineering point of view, is relatively simple: It consists basically of marine tankers and a lot of pipeline, most of which is already in place as part of a natural gas system.

Therefore, you might wonder why there has been such lengthy debate and concern over the project. The major problem is the number of jurisdictions and the permits that are required. Table 1 indicates where SOHIO is in this process. I've listed the permits as general, or relatively easy to obtain, and critical, or those that have required a great deal of effort. There are 59 environmental and 30 construction permits that are very critical. Of the critical permits submitted so far, only about 30 percent have been approved.

Of all the permits, the most difficult are those associated with air quality. When SOHIO began this project, they and many others, including myself, believed that the critical path for approval involved dredging and dredge disposal. We were simply not aware of the political gamesmanship that would push air quality permits to the top of the list.

Table 2 lists the jurisdictions associated with permit approvals. It illustrates why the SOHIO management team flew to many parts of the West almost daily. The agencies involved in the approval process include: 10 federal agencies and 22 from four states (California, Arizona, New Mexico, and Texas); 22 more agencies in 12 counties; and 52 agencies or separate units in 19 cities. There were also six special districts, four railroads, and four companies or individuals involved. This is what SOHIO has confronted in striving to obtain the necessary approvals.

To further illustrate the complexity of the process, the air quality evaluations associated with the project are shown in Figure 4. It's important to recognize that neither the EPA nor the California Air Resources Board completely understood the air quality problems, that is, emissions associated with the movement of oil. For example, the Chairman of the California Air Resources Board indicated that this project would produce hydrocarbon emissions equivalent to those from six

TABLE 1 SOHIO Project Permit Status in March of 1979

	In Preparation	Submitted	Total	Approved	(%)
Critical Permits					
Environmental	10	49	59	18	31
Construction	4	26	30	9	30
General Permits					
Environmental	13	29	42	25	60
Construction	140	432	572	202	35
Total Project Permits	703				
Submitted	536 (76%)				
Approved	254 (36%)				

TABLE 2 Jurisdictions Associated with SOHIO Project Permits

Federal	10 Agencies
States	4 States, 22 Agencies
Counties	12 Counties, 22 Agencies
Local	19 Cities, 52 Agencies/Units
Special Districts	6
Railroads	4
Companies/Individuals	4

million cars. Yet once they understood the mechanics of moving crude oil and the related problems, that estimate was reduced to several hundred thousand cars. Ultimately, it was not hydrocarbons that were the key issue, but NOX (nitrous oxides) and sulfur dioxide. So there has been an elusive character to these emissions both technically and politically.

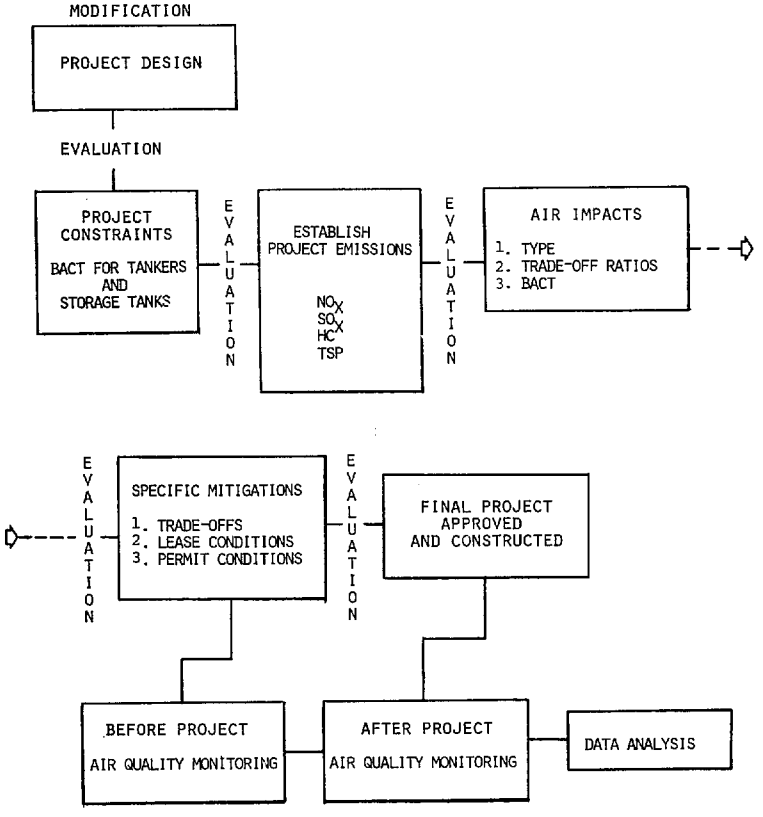

FIGURE 4. SOHIO Project Air Quality Evaluation.

As Figure 4 shows, the air quality review began with design evaluation. This resulted in a series of constraints, both mechanical

and operational, for the tankers and the storage tanks. Then the baseline emissions were calculated for the our major categories of nitrous oxides, sulfur dioxides, hydrocarbons, and particulate matter. The next step was to determine what trade-offs (offsets) were required. In the midst of this process a new rule, the New Source Review, was adopted. It dictated that any project planned for a non-attainment area (one that did not meet the ambient air quality standards) would have to provide trade-offs for all the project emissions in excess of the allowable levels. SOHIO was immediately thrown into this because the baseline emissions determined for the project exceeded that minimum level.

Further, it was determined that the trade-offs would be accomplished at a premium, that is, for each pound of actual emissions, the project would be charged for 1.2 or 1.3, etc., pounds. These trade-off values (ratios) were established after lengthy public debate -- some 14 days of hearings before the South Coast Air Quality Management District and extensive discussions involving EPA, the California Air Resources Board, the Governor, the President, Mr. Schlesinger, and others.

Once those ratios and the BACT (Best Available Control Technology) were established, the specific (individual facilities) trade-offs were determined, that is, the kinds of equipment that SOHIO would provide and how this equipment would result in the reduction of emissions at an existing operation. Resolution of these problems will yield final air quality approvals. SOHIO is now trying to resolve differences of opinion between the local air quality management board and the California Air Resources Board about the specifics of trade-offs.

As this air quality process evolved, it also led to a series of analytical reviews (depicted in the three lower boxes in Figure 4) of air quality before and after the project implementation. The EIR indicated that the project, with the trade-offs, would not greatly affect the air quality. There should, in fact, be less impact after the project than if the project were not implemented.

Throughout the permit process, there has been a great deal of public participation, as is evident from Table 3. There were eleven hearings on the EIS and four on the EIR, not just in the city of Long Beach but in many parts of the country -- in the case of the EIS, in several states. There have been 31 formal hearings, with one before the South Coast Air Quality Management District lasting 14 days. There are still more to come, since the specific trade-offs have not been approved. The City of Long Beach held a referendum, as the table shows, on whether or not there should be a SOHIO Project. It was supported by 62 percent of the voters. Finally, there have been a number of formal presentations, at least 25.

Within that mix of agency and public participation, a number of problems have emerged as part of what you might call a decision process through confusion and disagreement.

To begin with, one of the key problems which SOHIO and others did not envision at the outset was the lack of energy policies. The absence of these at the federal level was problematic, but more problems were

TABLE 3 Public/Government Participation in SOHIO Project

Public Hearings on Environmental Documents:	
EIS - 11 Hearings	
EIR - 4 Hearings	
Formal Evidentiary Hearings:	
Senate	4 Hearings
House	6 Hearings
FPC/Federal Energy Regulatory Commission	3 Hearings
California Public Utilities Commission	1 Hearing
South Coast Air Quality Management District	1 Hearing lasting 14 days and still more to come
Formal Hearings:	
National Transportation Policy Study Commission	1 Hearing
California Air Resources Board	2 Hearings
California Coastal Commission	7 Hearings
Long Beach Board Harbor Commissioners	4 Hearings
Regional Water Quality Control Board	2 Hearings
Referendum:	
City of Long Beach - Municipal Election, November 8, 1978 - 62% Voter Approval	
Formal Presentations:	
25 Individual Discussions at Technical/Civic Meetings	

generated at the state level. In the absence of an "energy policy," the political games between the key actors in California made it very difficult for anyone, not just SOHIO, to determine what was required.

The second point that became clear is that the public does not understand oil operations, particularly a system that transfers only a large volume of crude oil, which made it difficult to gain public understanding of the role of California as an "energy window" for the rest of the nation.

A further problem was uncertainty about tanker operations, that is, actual procedures for unloading oil and whether these produced large volumes of "fugitive emissions."

Another key issue was regulatory agency boundaries, with overlapping and narrow jurisdictions, and one agency saying, "Our jurisdiction only deals with coastal dependency," and another one saying, "Ours only deals with air quality."

Federal and state political gamesmanship also became a problem, for instance, the desire to maintain California's indigenous crude oil production at a high level, with concern over introducing North Slope oil. The largest producer of California oil is, in fact, state and local government.

The role of the public in the decision process has been particularly

disturbing to SOHIO. California is on the "cutting edge" of the multi-faceted approach to public participation. This process of decision by consensus has been quite evident, and SOHIO representatives, steeped in corporate management, have shown intolerance in many instances.

Finally, and perhaps the most significant problem, is what I think of as confused eco-ethics. Two examples will illustrate this. Initially, the Chairman of the California Air Resources Board tried diligently to ensure that the SOHIO Project did not go forward. Whether his intention was to see that it never went forward or to develop a better bargaining posture for California is not relevant. The point is that at the beginning he used every available means to stop the project. Ultimately, when it became appropriate to approve the project, he and others discovered that to get public acceptance was well-nigh impossible and that you can't change from a total conservation ethic to a development ethic without losing some of your credibility.

A second illustration of misunderstanding the prevailing eco-ethics occurred because SOHIO, as a small midwestern marketing and refining company, was ill-equipped to deal with California's regulatory process. Further, they attempted to manage the project from Cleveland, rather than having on-the-scene managers who could recognize the peculiarities of California's public participation process and the multi-faceted commissions and boards that review projects like this one.

Recently, for example, the Coastal Commission was to vote on a critical amendment to add storage tanks to the already-approved marine terminal. Approval hinged upon whether locating those tanks at the terminal would lead to fewer air emissions than locating them somewhere out of the coastal zone. Before the Coastal Commission, you must have approval by a majority of those appointed, and the magic number is seven. After about three-and-a-half months of cajoling, discussion, and recalculating numbers over and over again, we had obtained a straw vote of six, with three members absent. At the next meeting, a newspaper article that quoted a local SOHIO management individual as being in disagreement with the League of Women Voters over air monitoring was passed up and down the Coastal Commission head table. One of the commissioners who had promised to vote Yes voted No, and the vote was six in favor, five against. This delay in the approval of the tanks occurred because someone in SOHIO was not aware of all of the various eco-ethical forces associated with regulatory review in California.

In conclusion, public participation has been heavy in the review of this project. It will continue to be so until the final permits are received by SOHIO. Public participation has not been a bad influence; rather, it has indicated that until we understand the whole "perspective" of public participation as a goal, not just a process, we're not going to be able to approve projects in any more of a timely manner than has been associated with SOHIO.

O'NEILL: Thank you, Don. Don mentioned that there were over 100 agencies involved in this. One of the agencies is the California

Coastal Commission. Bill Ahern will further explain its role. Bill has a Ph.D. in public policy from the Kennedy School of Government. He's had experience with other agencies such as the California Energy Commission and with California's legislature, and has been on the staff of RAND Corporation.

WILLIAM AHERN

Energy Coordinator
California Coastal Commission

Thank you, Russ. Those of you who were here last evening remember Mr. Bruce, of the law firm of Covington and Burling. He quoted from a federal judge's decision on the suit by the American Petroleum Institute and other oil companies against the Secretary of Commerce for having approved the California Coastal Management Program. Judge Kelleher, in his very candid decision, I must admit, described the whole process that he was dealing with as something of "high congressional purpose and low bureaucratic bumbling, confusion, and complexity." What he was describing, I realized, was my job at the California Coastal Commission, which is to deal with all energy projects proposed for the California coast. And each one is an incredible laboratory exercise in complexity, symbolism, and confusion, the interaction between federal and state legislation.

But we at the California Coastal Commission are just one of those permit-givers on Don Bright's list. And I would claim that the California Coastal Commission is an institutionalization of public participation, because it was created by the people of California in 1972. The legislature continued to refuse to pass legislation to protect the California coast and the people had to take the initiative. The commission passed by one vote in the Senate. We have 12 lay commissioners, who meet twice a month and are extremely regular people, except that most of them tilt towards protecting the California coast against development.

The trouble with the SOHIO Project is not so much the 10 or 12 tankers it will bring in each month, but the fact that a number of people in California worry about any more oil tankers going along the California coast. So there's a heavy, symbolic, value-laden level to this kind of project. This is an extraordinarily timely forum, because it's the tenth anniversary of the Santa Barbara oil spill. The SOHIO tankers, of course, were to go through the Santa Barbara Channel. Oil

spills, both because of media attention and their nature, grab the public's consciousness. When I walked into the commission meeting last week one of the commissioners immediately told everybody in the audience, not to miss the Nova show on the Amoco Cadiz. That was an incredible oil spill with effects that will probably last ten years, much longer than those of the Santa Barbara spill, which actually are very hard to detect now. But SOHIO ran into this great fear of oil spills and what they might do to the Coast.

The Port of Long Beach is already an industrial area. It has oil production islands that pump from an oil field under the ocean. They have waterfalls and palm trees and colored lights, and many people think they're quite nice and other people think they're the most hideous things they've ever seen. The port is definitely an industrial area.

You may be a little shocked to hear that the Coastal Commission almost unanimously approved the SOHIO Project more than a year ago, with a vote of 11 to nothing with one abstention. The reason was that the ports have very outmoded tanker facilities. We saw the SOHIO Project as providing some new tanker facilities for the Port of Long Beach. And the legislation we operate under, the California Coastal Act of 1976, says that, if you're going to have to have an oil terminal, put it in an industrial area so you're not messing up the beautiful, remote, relatively underdeveloped parts of the California coast. It's a very clear policy, and it's why the commission was able to approve the project.

However, even in an industrial area you have use conflicts. Those big oil storage tanks 60 feet high and 140 feet in diameter make some of our commissioners feel that we're just dumping one thing after another on the City of Long Beach. You've got this inherent land use planning conflict: you're either adding to other industrial facilities or you're ruining a remote part of the coast. It caused a terrific amount of tension when these tanks came up for consideration in front of our Commission.

As Don Bright mentioned, a major problem was the air emissions permits. The emissions from the tankers are the major problem, and the things in the media about tankers causing the emissions of six million cars -- even though our commissioners, 12 lay people, aren't supposed to deal with that -- are in their heads when they consider this project. I was out there on the channel when an Arco tanker was blowing its tubes, which they do for a few minutes when they put the engines in reverse. The impressive outpouring of smoke that you see in the photograph in Figure 5 had soon come and covered us in soot, a very graphic demonstration of what tankers can do. Of course, this would be totally illegal for the SOHIO tankers to do. But nevertheless, this kind of thing gets into people's minds when they are dealing with the project.

The air emissions factor means it's going to be very difficult to get your permit in an industrial area like Los Angeles because it's a non-attainment area for standards. So the air quality policies make it easier to go to remote parts of the coast where you can put out more emissions and not have the serious requirements; however, our coastal

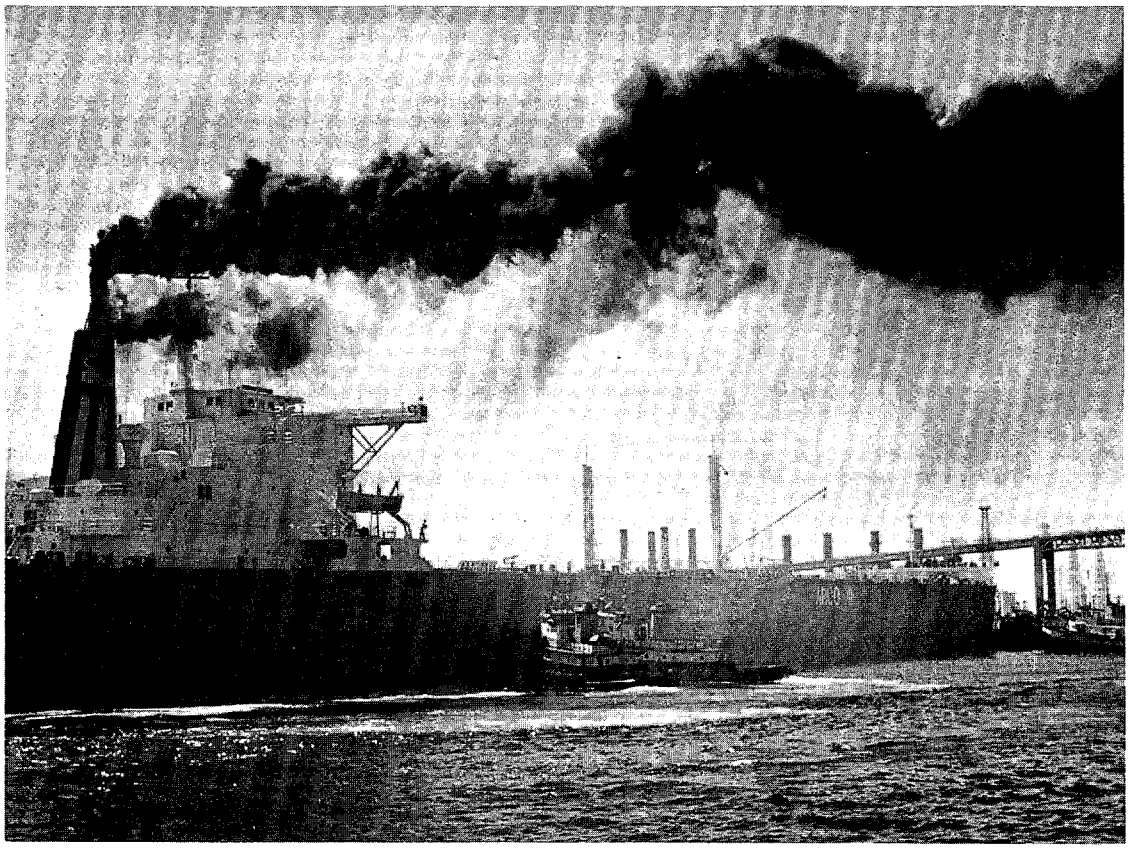

FIGURE 5. Tanker blowing tubes.

legislation, approved by the Secretary of Commerce, operates on just the opposite policy and says, put industrial facilities in industrial areas. It got to be so crazy that the governor's office studied the possibility of putting the SOHIO Project in San Luis Obispo Bay, about 150 miles north, to try to solve the air emissions problem. Of course we in the California Coastal Commission probably would have gone beserk if SOHIO had ever made a proposal to do that, but since it came out of the governor's office we kept quiet and the proposal sort of died.

Well, my theme is that some of the fears we have in California when we see each major energy project create sort of a mess in the approval process. At the Coastal Commission, we generally give a decision within 42 days, and even when it's a denial -- and there are a decent number of denials -- at least the commission acts and people who come before us say at least you made a decision.

Out in California we do have strong values about protecting the coast, but they may be in jeopardy because of what is happening with seaward coastal energy facilities such as the SOHIO Project, the Seabrook Nuclear Power Plant, and the LNG terminal in California. When Exxon wanted a couple of acres for an oil and gas processing facility in

Santa Barbara County, they got all the way through a referendum and then, in effect, got denied by the Coastal Commission. The coastal permitting process is extremely complicated, and it's not clear whether it benefits the public. I think things could now go two ways. One is the soft energy path, because of the process that hard energy projects have to go through, and many people in California would say that's the way it ought to be. And many people on the SOHIO Project would say the best place to send that oil is to Japan, both for economics and environmental protection, and why are we dealing with California at all?

On the other hand, I see a trend that these decisions are being pushed up to the higher levels of government. Already in California, the Coastal Commission and the local government are preempted when it comes to dealing with electric power plants and liquefied natural gas terminals. The legislature said that the processes were such a mess that they created special agencies or gave special one-stop shopping authority to an existing agency. I have no doubt someone's going to propose this year in Washington that there be some kind of congressional decision on the SOHIO Project, just as they did on the Alyeska pipeline. And what I see in the future, to the detriment of public participation, local government roles, and regional differences and values, is that 20 years from now when some company wants to build an oil terminal, they will go to the Department of Energy and present an application showing the cost of the energy and how much energy the terminal will provide. The Department of Energy will put it into a national input/output model connected to an energy supply substitution model and an energy demand model, as well as to the Wharton or the Chase econometrics or some national total equilibrium model. And in about five minutes, out comes this printout that says whether there's a net national-interest economic benefit in the project or not. And if it shows a plus in front of your project, then you go over to the National Industrial Facility Site Bank. What this site bank has done for every region of the country is to rank all the potential sites for industrial or energy facilities. If you apply for an oil terminal of such-and-such a size, the site bank pops out a map, let's say, of Southern California, and it shows the site that you get. And then you go over to the Environmental Protection Agency, and because of the demand for specific standards, you take all your manuals on the Best Available Control Technology -- which will probably fill this room, but nevertheless, they'll be very specific on what your're supposed to do -- and you have your project. The whole process takes about a day of walking around Washington. We in California -- local governments, the public, the League of Women Voters, the Sierra Club regional offices -- will get to participate in the site bank and in the equations in the model, but that will be the level of public participation. And that's the way I see things turning out, given the way they're going now. Thank you.

O'NEILL: Frank Mosier, the next speaker, is a chemical engineer who has done his postgraduate work with SOHIO; he's been there for 25 years and has had a wide range of responsibilities, from process design to

corporate planning. At present, he is responsible for supply and distribution and transportation, and his specific assignment would include the sale of this Alaskan North Slope crude oil and the acquisition of crude oil for all of SOHIO's refineries on a worldwide basis.

FRANK E. MOSIER

Senior Vice President
Supply and Transportation
Standard Oil Company (Ohio)

I'm going to try to hit on a few points that haven't been emphasized today and to give you some perspective on SOHIO's point of view on this project.

First, I'd like to say that it was suggested that we limit ourselves to 10 minutes. That's all right. We've put 50 million dollars into this project, and it is rare that we have equal time.

To paraphrase the old comment about domestic wine, this is a rather humble little project and even we are amazed by its presumption at times. Four years ago when we got into this thing, if someone had indicated it would become a subject for discussion before the National Academy of Sciences, we would have scoffed; we wouldn't have believed it. It's a very simple project, as Don Bright has pointed out, and in fact it's even simpler than he suggested. It's a classic example of making a mountain out of a molehill. It's also a classic example of what happens when you get into the ultimate in public participation, and I'll cover that a little later.

The current concept of the project involves a couple of tanks on Pier J, a couple of jetties, and a few miles of 48-inch line tying into a 1000-mile system of existing gas pipeline. This pipeline was deemed to be surplus by the gas company and subsequently, after several years of study here in Washington by the FPC, found to be surplus.

What are we going to do with the line? Well, we had planned to move about 500,000 barrels a day of Alaskan oil which, by the way, is not suited to West Coast needs. It happens not to fit into the current refining configuration on the West Coast, which needs a somewhat different kind of crude oil at this time -- specifically, Indonesian sweet crude oil, which is imported at the level of some 400,000 to 500,000 barrels a day.

We started thinking about the need for a pipeline to move this

residual of Alaskan crude oil from the West Coast to the Midwest back in 1973, just about the time the TAPS enabling Act was passed. Why was there this indicated need? Because the OPEC countries got together and decided to increase the price of crude oil from $3.00 a barrel to $12.00 a barrel, and as is normally the case with this kind of situation, the demand for crude oil went down. Also, the price of a lot of other things went up. As a net result, refinery modifications and new refinery capacity contemplated for the West Coast were not built. The demand for products went down and existing refining utilization did not result. Therefore, we had to move the oil. Refineries could have been modified to accommodate Alaskan oil, but certainly not at a cost of about three times as much as had been contemplated six months earlier.

Two years later, after studying alternatives from the Panama Canal to northern Canada, we decided, not so casually, to go to Long Beach for some of the reasons that were pointed out here this morning. It was already a highly industrial area; we did not visualize this as an environmental problem of any magnitude. After all, if we're going to continue to move the excess oil to Panama, we're going to be moving a rather substantially larger fleet of tankers past the same West Coast ports, stopping for bunker fuel and then going on to Panama.

In fact -- a point which is rarely ever mentioned -- the incidence of tanker-caused air emissions and potential pollution to the waters in that area would be reduced by our terminal if we traded nothing off. The project in itself would reduce the emission situation in the area because California can't really legislate Alaskan oil off this planet. Some people probably would have liked to, but they are unable to. The fact is that a shuttle fleet running to Panama on a continuous basis would be considered by almost anybody looking from a broader point of view to be a much more significant environmental problem than stopping off somewhere along the way and unloading the tankers, putting the oil into a pipeline, and moving it to market by that mode.

Certainly this project had a great deal of economic merit to the Standard Oil Company of Ohio. We would have saved somewhere in the vicinity of fifty cents to a dollar, depending on how one viewed it, on every barrel moved through the pipeline. Therein lies the reason why, after four years, we're still in the picture. I submit to you that very few industrial or commercial projects that I have ever been aware of would have been able to get through the morass and labyrinth pointed out by Dr. Bright: they would have given up a long time ago, as did Dow Chemical.

In order to facilitate this kind of a procedure, one has to have an overwhelming incentive to stay in the ball game. Most industrial projects of any kind would never make it. We're still in the game, and we probably will continue for some period of time to be in the game. However, obviously with each passing year the picture changes.

Now, I've talked a little about the characteristics of the project, and I might add that we expect about one ship every three days on the average. We're talking about ships that haul 1,200,000 or 1,500,000 barrels, and thus about an amount of oil ranging from 450,000 to 500,000

barrels a day. The average emissions from one of these tankers discharging would be something like 600 pounds an hour -- or 600 pounds a day, I believe, is the number -- of sulfur oxides and about the same amount of nitrogen oxide and 10 percent that amount of particulates.

The project apparently is considered to be in the national interest. I won't argue that point. The President of the United States has made that comment. All the major policymakers in the energy field have acknowledged that this project is in the national interest. It certainly is in SOHIO's interest, or we wouldn't have been pursuing it.

The project has widespread support; it has considerable support by -- as I said -- the administration, by many members of Congress, by many agencies in Washington, and as far as we know, by the administration in California, by many of the agencies and legislators in California, and by an overwhelming mandate from the people in the City of Long Beach, as well as many other miscellaneous officials. But the facts are that the project hasn't been aproved. We do not have a permit, even though the project meets tests such as being economically sound and we're ready to finance it. Technically it's a piece of cake. Why hasn't it been approved?

I won't take you again through the labyrinth that Don Bright has covered on this thing. In very simple terms, the problems have included legislation well-intended but not very clear, proliferation of agencies with various viewpoints, rules and regulations promulgated at the drop of a hat, and the year and a half it took to prove that, in fact, we had emissions. If we had emissions, one would have thought it would have been a fairly simple process to prove it. In fact, it took almost a year and a half to demonstrate that there are emissions attributable to the project, and one had to eliminate Alaskan crude as a part of the base case in order to arrive at that conclusion. Regardless of all that, SOHIO decided to expedite the project. We agreed to accommodate those who believe emissions should be attributable to this project, and we will trade them off. We agreed to take the trade-off package that you insist we use, even though we don't believe it's necessarily either the best or the most cost effective. We agreed that we will not vent vapor all over the atmosphere. We agreed to bring in the latest new tankers specifically designed for this project and meet the rules and regulations far beyond anything that the Coast Guard or the United States has ever imposed on any port. We agreed to do all those good things. In fact, we said, we'll do whatever you want to do. Just tell us what you want us to do and let us go ahead.

We are still tied up in the rules and regulations and the endless sequence of hearings, a situation where we go from agency to agency and hearing to hearing. Why? Because under public participation as practiced in the State of California, unanimous consent is required to do anything. If there is one guy, one group, anybody with a will to stop you, he can and will.

Now, is that good or bad? I don't know. I'll leave that question up to you. But if anybody accepts the fact that doing nothing is an acceptable alternative in most instances, then you'll feel that that's

probably a good idea. I question whether in fact that's good for the country as a whole or for California specifically. I certainly would emphasize that it has not been good for us.

O'NEILL: We'll conclude with one of the voices listed as not in unanimous agreement. Jan Smutny-Jones is Chairman of the Citizens' Task Force on SOHIO and has worked with the Coalition of Neighborhood and Community Associations in Long Beach. He is still going to school; he's at Cal State University at Long Beach studying political science. He paints houses to support himself.

JAN SMUTNY-JONES

Chairman, Citizens' Task Force on SOHIO

I'm probably the first house painter ever to address the Academy. Thank you for the opportunity to speak here today. After Mr. Mosier's very eloquent talk on SOHIO and the supports SOHIO has, I sort of feel like David being forced to apologize to Goliath, but I'm not prepared to do that. Time is too short, unfortunately, to make a strong case on any of the specific issues which the Task Force and a number of other hometown and community groups in Long Beach are concerned with. I will therefore, for the sake of both argument and clarity, make a number of assertions on this project from a citizen participant point of view. These aren't meant to be inflammatory, but hopefully to initiate an animated dialogue.

One of the key issues you've been aware of all along is air quality and how it relates to seaward development, specifically to Long Beach and the SOHIO Project. People may imagine beautiful blue skies over the Port of Long Beach. In fact, most of the time over Long Beach we have a different kind of blue; it's called industrial blue. It's sort of a brown haze that hangs over the city, and it's a living reminder to the people of Long Beach and the people in the Los Angeles Basin that we have very serious air quality problems.

The SOHIO British Petroleum Project has direct impacts on the air quality within the Los Angeles Basin, and specifically on some very different kinds of air quality problems within the city of Long Beach. I'm referring primarily to sulfur dioxide from their tanker operations and the trade-off propoals, and the issue there is who benefits from the trade-offs.

Second, the SOHIO Project, in our opinion, will further aggravate the

already problematic West Coast gas situation by tying up two of the six natural gas pipelines that currently run from the Midwest into California. As they have signed an agreement with El Paso to use two of the gas lines, we're assuming that within a relatively short time it will make economic sense for SOHIO to expand their project.

We also believe that while SOHIO experienced some initial problems with the complexities of California politics, it has, in fact, recently acquired some rather preferential treatment both on the part of the Governor and the various state agencies.

An issue that will become increasingly important is the tanks on Pier J. You'll hear two different sides. One will say they're important to keep air emissions down. You will hear from us that that is a totally inappropriate place for those storage tanks, for seismic and planning reasons, with which the Coastal Commission has concurred. As Mr. Ahern said, well over a year ago the Coastal Commission granted SOHIO the permit, and yet no other agency or SOHIO has so far acted upon the new port configuration which they were given by the commission. We also believe that those tanks are not necessary for a 500,000 barrel project, but are designed for a million-barrel-a-day project.

We are obviously concerned with a rather parochial question, but we believe the SOHIO facility is in conflict with the city's attempts to develop a more labor-intensive recreational and tourist-oriented economy. The SOHIO Project virtually guarantees that Long Beach will be increasingly used as a West Coast entry point for petroleum, further complicating atmospheric and oceanic impacts of handling petroleum products as offshore oil development begins to develop in Alaska, the Yellow Sea, South China Sea, and offshore California.

We've been asked to address the national interest issue. We fail to see how the self-induced private marketing problem of a foreign-owned oil company constitutes a national interest issue. Regardless of all the saber-rattling, it has never been clearly pointed out to us how we are, in fact, standing in the way of the national interest. We believe that, as a matter of fact, this problem was created on the national level. In short, the Alyeska pipeline was built to the wrong place, and that is why we have a West Coast surplus of crude oil, and we feel a little shaky when suddenly we hear we're holding up the national interest.

Finally, if SOHIO has been as cooperative as Mr. Mosier has just stated, I submit that they would be pumping oil through their pipeline at this very moment. The facts are that they haven't. As I said before, the Coastal Commission over a year ago issued a permit telling them what the project should look like. They asked for that permit at that time so they could act accordingly. They have yet to act on that. Well over a year ago, Tom Quinn of the Air Resources Board basically said that he would cut the deal with sulfur dioxide scrubbers. It took an extremely long time; as a matter of fact, at this very moment, there is no solid agreement between all the parties involved that that scrubber technology is going to go into Long Beach and be used as a mitigation measure. There is a serious problem there. What I am saying

is it hasn't been as clear-cut as it has been put forward here.

These are a number of our concerns and, hopefully, we can address them later. But the public involvement process is just that: a process. It's not an end in itself. I don't believe that if SOHIO comes to Long Beach or if they don't come to Long Beach this country is going to fall apart, nor do I believe that citizen involvement is going to be wounded beyond hope. I think what we have to view citizen participation as is a process which all these projects are going to have to go through. And if tomorrow they start dredging the harbor and pumping oil through the pipelines, the SOHIO Project is a better project environmentally because of citizen participation.

GENERAL DISCUSSION

O'NEILL: Before we get into the discussion period, I would like to call one of the publications out on the table to your attention, "Public Involvement in Maritime Facilty Development," which includes as one of the cases the SOHIO Project.

The chairman of this committee of the National Research Council is with us today, Oliver Brooks. I would also like to introduce Admiral King, the executive director of the Maritime Transportation Research Board.

As you may or may not know, the four panelists have been together in many hearings, but they still might want to exchange a few questions back and forth during the discussion. In particular, though, I'd like to get the audience involved.

OLIVER BROOKS, Consultant and Chairman, Maritime Transportation Research Board's Ad Hoc Committee on the Impact of Maritime Services on Local Populations: I'd like to ask a three-part question, but I will try to make it brief. First, what are the long-term tax realizations in the City of Long Beach, assuming the construction of this oil discharge facility? Second, what role, if any, did SOHIO or its direct or indirect agents play in the Long Beach -- or in the period prior to it -- referendum vote? Finally, did any of the other communities in the Los Angeles Basin have a piece of the electoral action beyond the one inherent in the activities of Mr. Ahern's Coastal Commission and Tom Quinn's Air Resources Board, et cetera?

BRIGHT: The long-term tax realization for the City of Long Beach is quite minimal. Prior to the enactment of Proposition 13, there would

have been approximately 14 million dollars' worth of revenue generated each year from the project. Of the total, a portion would have gone to the Port of Long Beach, a little over a million, with about one million to the general fund of the city; half a milion to the junior college district; 1.9 million to the local elementary school districts; and the remainder to other jurisdictions along the pipeline right-of-way. But Proposition 13 reduced the City of Long Beach's share to about $110,000 a year. There is a comparable reduction in the revenues for the other jurisdictions. Therefore, the long-term tax realizations for the political entities involved really are small for this project.

Let me leave the referendum and SOHIO's role to Mr. Mosier and jump to your third question: whether other communities had a piece of the electoral action. Only Long Beach citizens voted on the project. Many cities chose not to react other than through the ministerial processes. Yet public hearings occurred along the entire pipeline route, which provided opportunities for almost everybody to participate in the process, either in a broad sense, such as analyzing the EIS and the EIR, or in concern over details, such as the alignment of the pipeline along their particular street. So the community action has been extensive, and SOHIO has had at least 40 people participating in these efforts.

O'NEILL: Frank, do you want to answer the second question?

MOSIER: Well, we played a very significant role prior to the referendum vote in Long Beach. As I indicated earlier, we'd already invested 50 million dollars in this project, and that in itself would suggest that we had a very keen interest in the outcome of the referendum. We spent a great deal of money, time, and effort on the campaign program in that referendum vote.

SMUTNY-JONES: I'd like to address Mr. Brooks' questions, too. The long-term tax generated from the project we don't see as significant. There are people in the city who do. The Citizens' Task Force and the nine homeowner community groups who put the referendum on the ballot obvously did not see it as a tremendous economic boon to Long Beach.

With regard to the referendum, it's an issue I'm sensitive about since we were responsible for putting it on the ballot. I think there's a graduate student floating around who will base a Ph.D. on it, because it probably set a precedent in terms of the amount of money spent in a local campaign. We ourselves spent a little over $15,000. In a city like Long Beach, that's a fair amount of money for a referendum. Opposed to that, though I haven't seen the figures, the papers said that SOHIO was going to spend in the neighborhood of $750,000. I'm not whining about that. There was a tremendous output of computer letters, a well-orchestrated media campaign. They did a very good job of that, and I give them credit for it.

But I don't believe that puts the overwhelming majority of Long Beach citizens in their camp, because I think a key issue -- and a rallying cry behind the Yes-on-Y forces -- was more jobs and cleaner air. In

other words, we believe that 60 percent of the people voted for cleaner air, and we have every intention of holding SOHIO to that mandate.

JOSEPH GUSTAFERRO, U. S. Department of Commerce: One of the things that kept coming up here was the national interest, and my question -- which I will follow with a comment -- is, what model are you using to determine the national needs? In other words, what kind of a supply-demand balance or monetary balance? The reason I ask this question is that we in Commerce, which is the repository for a tremendous amount of data, have not been able to find a satisfactory model to determine the national needs. We went out and generated our own, which is in a preliminary state. Some of you might have gotten copies for comment. It is a preliminary forecast -- I don't remember the title, I only wrote it -- of likely U. S. energy consumption and production balances for 1985 and 2000 assessed by states. We were very presumptious in doing this; we took each state and indicted to the last windmill where energy sources would be located and how many would be in the state, how much oil would be generated, how many nuclear power plants would be required and how much electricity per capita, and so forth.

So I'll go back to my question: What did you use to determine the national needs?

MOSIER: We didn't make that initial determination. It was made by the Department of Energy. And I think it's based pretty much on this reasoning: that our proposed pipeline, if it were related to the transportation of half a million barrels of oil to Texas versus shipping them through the Canal, is absolutely not an issue of national need. The point is that the expansion of frontier oil production in Alaska and of other oil from the West Coast is contingent on a pipeline of this kind. And the Department of Energy and Dr. Schlesinger and others are very keenly interested in the development of a West-East pipeline to permit the expansion of the Trans-Alaskan pipeline and the development of other sources on the North Slope. Obviously, oil companies that have interests there are not in a position to expand that production if there is no place they can go with the oil. We're fully utilizing the Jones Act fleet at this time to move the available excess of Alaskan oil through the Canal, and we're concerned that increases in throughput capabilities of the Trans-Alaskan pipeline, to the extent of maybe a modest 150,000 barrels a day, really could not be practically accommodated by the Panama Canal even if we had the Jones Act tankers. Therein lies the dilemma. I'm not as well equipped or prepared to comment on this as DOE, since they've made those studies. But that is the main thrust of the issue; it is not the current level of production, it is providing the opportunity to move additional oil out of Alaska, whether it comes from the North Slope through the pipeline, or over the Bering Sea. If we're lucky, maybe somebody will find some oil in the Gulf of Alaska. But that is the issue, and it translates into fundamentally a balance of payments and imports.

AHERN: It sounds like my prediction is coming true. The Department of Energy has a model, the California Energy Commission also has a model, and the Federal Energy Regulatory Commission probably has a model, too. And the Coastal Commission, of course, is supposed to take into account the national interest when it deals with a permit for any coastal development in California, but particularly for something like the SOHIO Project. That's a requirement of the federal Coastal Zone Management Act, and that's just about how specific Congress was. They said consider the national interest. They didn't say accommodate the national interest, all they said was, Consider it. So when we got the SOHIO Project permit, the Coastal Commission said, how in the world do we do that? And it occurred to us that the national interest has become a buzz word for energy supply. But it is not just energy supply; it's also Redwood National Park and Point Reyes Seashore and Big Sur, and the reason that California has a federally-approved coastal management program is because there is a national interest in protecting the California coast. So that phrase should not be a buzz word for economics or energy suply, but that's what it has become. To take care of that part of the national interest, the Coastal Commission said, we'll write the Department of Energy and ask them if the SOHIO Project is in the national interest, and then we'll consider their reply. So we wrote Jack O'Leary, the Deputy Director. He wrote back something I would have to call a bit waffle-worded: "We do not have the authority to judge whether projects are in the national interest or not. However, the SOHIO Project does have national energy benefits." So we copied the letter and sent it to all our commissioners so they could consider the national interest.

We also, of course, referred to the President's National Energy Plan, but then we found out there were all sorts of people who disagree with what it says, including committees of Congress. And as you know, much of the national energy legislation that came out had nothing to do with the National Energy Plan, so we had a hard time using it as a guide to the national interest.

We anticipate there will be more models that will come up with more results on what the national interest is in energy projects. Part of our problem was that the California Energy Commission -- with all their models and analyses -- came up with the conclusion that the national interest was to export the oil to Japan. You could make more money on that and help save the dollar, and you'd avoid all this capital investment and this business of cross-continental pipelines and marine terminals. To some of our commissioners, that made perfect sense. So it's a very confused picture, and I guess it's part of the dynamic interplay among agencies with different interests. In our case, it was left up to our 12 commissioners to determine whether the SOHIO Project was in the national interest. They decided it was.

SMUTNY-JONES: Obviously, that's an issue we've had to deal with from the other end quite a bit, and as I said earlier, we aren't convinced that this project is in the national interest. I think if we've learned

anything over the past fifteen years, some of them very bleak years, it's to be very cautious when someone starts talking about the national interest because it could, in fact, mean anything. The SOHIO pipeline was not a part of the original Alyeska plan; it was sort of an afterthought. I think that's revealing of the phrase "national interest." I think it also telling of the national interest -- and I think Mr. Mosier quite candidly said this -- that what we're really concerned with here is future development of oil resources. It seems that DOE is still dealing with the oil situation as a problem of production. Obviously, the real issue is not one of production, but of consumption. After so many years of the energy crisis, we are still consuming a record amount of petroleum. If this was, in fact, such an overwhelming national interest issue, we would probably hear quite a bit of talk about building a new pipeline, 42-inch or whatever, designed to accommodate all of this future oil. Yet that never gets discussed, either by the federal government or by the other agencies involved. And finally, there are a number of alternatives -- some of them very feasible, some of them less so -- which could also serve the national interest.

Mr. Ahern raised the alternative of Japan. About two years ago we had the fortune of testifying before a Senate committee -- ironically, on Pearl Harbor Day, 1976 -- and in an unusual display of solidarity, the oil companies, the state agencies, and the environmentalist groups who were represented all agreed on one thing: that an oil exchange with Japan made perfect sense. Well, there's a problem with that, because not long ago we heard that we were supposed to approach the energy crisis as the moral equivalent to war. Less than a few months after that statement was made, the Department of Energy came out with a very candid statement saying that exchanging oil with Japan was politically inexpedient. Now, what that means is, first, that a lot of people believe that there is such a thing as Project Independence -- that ghost is still wandering through the halls of the Capitol -- and second, that a lot of us evidently still haven't forgotten World War II.

So one of the alternatives which would clearly serve the immediate national interest was cut off. And I think that's a serious problem that needs addressing.

BRIGHT: There is one other key issue here: the absence of crude oil transportation links from West to East. Traditionally, oil has moved from the Gulf Coast area into the Midwest. California utilized its own indigenous production until environmental constraints established the need for very low sulfur crude that was not available in other parts of the United States. Also, in the Northern Tier area sweet crude from Canada is used. To summarize the issue, the increased environmental problems, particularly air quality, the declining supply of natural gas, the inability to rely exclusively on California crude because of its sulfur content, and the dwindling supply of sweet Canadian crude in Northern Tier refineries, all indicate the absence of adequate transportation links for getting energy into the right areas.

It now is clear to many people that a barrel of oil isn't always a barrel of oil, because you can't necessarily use it in any given place. Just getting it there doesn't make as much sense as it has in the past. When you consider the need to be able to ship California crude where it can be refined or to be able to deliver Alaskan crude to refineries in the Northern Tier for blending with sweet crude, you can see that the SOHIO Project is not the answer to the distribution problem of excess oil on the West Coast, but one of the answers. It will increase national capability for mixing and matching batches of oil to meet both energy and environmental requirements. In that context, the SOHIO Project is distinctly in the national interest.

DAVID MARTIN, Attorney and Public Affairs Consultant, Washington, D. C.: Until recently, I was Research Director of a small federal agency entitled the Administrative Conference of the United States, whose mission is to study the administrative legal procedures of federal agencies. And one of the things that I've spent a lot of time doing in the last year or so is designing a project which the Conference has just commissioned to study the efficacy of citizen participation on federal agency behavior.

I guess the discussion last night made clear that the function of citizen participation is to leaven the decision-making behavior of agencies of government, which tend to be somewhat specialized and parochial in their point of view, with an input from the citizenry that will lead to a wiser decision than the agency would have otherwise undertaken. In short, we think of citizen participation as a process that will tend to leaven, educate, elucidate, and improve the quality of understanding of matters about which decisions have to be made.

Perhaps others shared my shock, therefore, at Mr. Mosier's statement -- I think he said, this project is a piece of cake.

MOSIER: Physically.

MARTIN: I don't know what it means to consider this as a physical project, Mr. Mosier, in view of the discussion. That's one rather narrow aspect of the project, and the purpose of all the permitting requirements and the citizen participation opportunities is to assure that the decision will not be handled as though it were purely a technical project. But to come to my question, has the attitude of any of you been altered by the experience of citizen participation?

MOSIER: Maybe I ought to make the first comment on that. First, as far as I know, nothing has developed in the hearings from so-called public participation that has changed any aspect of the project one iota. Second, if the taxpayers are going to pay for the expertise assembled in agencies and develop regulations and spend millions of dollars studying all of the implications of projects like this, how on earth can a public hearing with little or no available information to the public in terms of the depths and implications of these projects

contribute anything other than the narrow viewpoint of individuals who may personally be affected by something in their back yard?

In fact, that's exactly what we've learned from this. There's always going to be somebody affected. No project conceived by man will have unanimous support. Mr. Jones has every basis to have personal reasons for not particularly liking this project. But the fact is that the inputs have done nothing to alter -- that I'm aware of -- the physical makeup of this project in any way, but have accomplished one thing and one thing only: to delay it interminably, in effect, to ultimately escalate it from the administrative and/or executive branch of the government to the legislature, either of California or the nation, into the courts in the final anaysis. And that's probably the ultimate conclusion. That's what we've learned from it.

AHERN: Many of our 12 commissioners were appointed because they had been public participants in front of the Coastal Commission, and now they very much want public participation when they make decisions.

There are two different roles of public participation that make it a very difficult thing to get a handle on. One is people coming in and saying what they want the agency to do, regardless of what the agency's legislation is. These are the ones who don't want a house built that's going to affect their view of the ocean.

Then there are other people -- and they're the most effective -- who come in and say, your legislation has this policy against developments in hazardous areas in the coastal zone. And the way that you should interpret that with respect to this project is not to let those tanks be put on Pier J. That's very effective public participation; it's the kind that holds Congress or the state legislature over the administrative decision-makers' heads. And there's no doubt that if the vocal public in the Long Beach area represented by Jan Smutny-Jones here had not appeared in front of our commission, the tanks would not have been as much an issue as they were, and the decision probably would not have gone the way it went.

Now, much to my shock and discomfort, the commission voted against the staff recommendation to approve these tanks on Pier J. And I don't think they would have done that had there not been people in there from the local area saying, Commissioners, the thing you should do under your legislation, despite what your staff is telling you to do, is not to approve those tanks on Pier J. So that kind of public participation overwhelmingly lends support to administrative decision makers where they have to make a judgment that could go one way or the other under their legislation. But an awful lot of public participation is not effective because they don't understand the legislation and regulations.

So we definitely had what I would call effective public participation, but it was more a matter of pushing things in a direction on which our commission had judgment than adding information and analysis because, as Jan said, they're all part-time while we're full-time staff doing analyses. They did bring up a number of points, such as the failure of oil tanks in Japan, that got our commissioners'

attention, and then they told the staff to go look into this some more. But it's definitely effective in front of our agency because it's 12 lay people, and people are frequently comfortable talking in front of them because they know that our commissioners want to hear from "the public." Much depends on the agency and what it's supposed to be doing.

SMUTNY-JONES: I guess the question is what have we learned from the SOHIO project in the process. It's unfortunate that SOHIO doesn't issue Ph.D's because I think a number of us would be getting a degree there. Granted, the agencies are responsible for producing technical data. In our organization we have a couple of retired naval captains, a naval admiral, an old tanker master, a couple of lawyers, and a number of people who are homemakers, et cetera. We have a very divergent group of people. None of them are meteorologists or seismologists -- their expertise or involvement is on a very different level.

We're not an hysterical group of people who have been able to hold off SOHIO by just appearing and screaming. What we've been able to do is look at reports prepared by agencies and by the Coastal Commission, some for Air Resources Board and various federal agencies, and try to analyze what's relevant and ask the significant questions. Environmental impact reports are supposed to be written so that the public can get some understanding of how particular projects are going to impact them and can respond accordingly. And that is exactly what we've done. We've been able to say, this is what the Coastal Commission says, this is what various agencies have said. The tanks on Pier J are a classic example. Dr. Bright and I probably can run off both sides of the argument because we've done it quite a bit before the Coastal Commission and elsewhere. But there you have two expert opinions. One says Pier J can undergo a process to make it perfectly acceptable for a storage tank farm, and the other says no, it's not acceptable at all. And both of those theories have been developed by geologists who appear to be competent, so there's a real problem there.

We've obviously raised the issue of those tanks because we think it will adversely affect us. But that's the point -- the the public relies on that technical data in order to respond in the public participation process and that is, in fact, the purpose of the data in the first place.

BRIGHT: I think that review of the SOHIO Project has had the greatest degree of public participation to date in California. Citizens in California are aware that there are many means for them to participate in the regulatory processes, to make their opinions known. This means, as Mr. Mosier noted, that one person can throw a monkeywrench into the process.

The California process is stil immature, and politicians in California capitalized on this immaturity as a means of trying to kill the project. To their chagrin, they discovered that having used the process that way, it was almost impossible to reverse it when, for political expediency, they were ready to support the project.

Also, there has been a discovery that the territorial imperative of certain state agencies is very strong and rigid, and trying to get them to consider a matrix of distinct but interrelated issues is an amost impossible task.

The SOHIO experience has been profitable as a consequence of the processing problems. For example, the state agency task force approach, first used for SOHIO, is being used on other projects. This involves a process where experts on project-related matters meet and develop mutual understanding. It is a joint exchange of concepts and ideas. This process has now been employed with considerable success on a large offshore oil project and a fossil fuel electrical generating plant.

In retrospect, if the "factors" in the SOHIO Project had recognized the significance of developing a clear understanding of key issues at the onset of project review, many of the roadblocks in the processing of the SOHIO Project would never have occurred. You may think it would have required somebody clairvoyant to have anticipated the key issues at the outset. Not really. It only requires somebody who can be responsive in an administrative, procedural way -- a good executive secretary -- so that understanding of issues develops prior to an impasse.

One other lesson from the SOHIO experience is that key people in the upper bureaucratic and political levels cannot remain aloof from projects until the final decisions are at hand. They must get involved early to understand the vagaries of what's going on and to be able to guide -- whatever that word may mean -- the final decision. For example, early in the SOHIO Project, many of the agency staffs understood the issues, and they made recommendations that were not accepted by the next level. So new recommendations were developed there, and referred to still higher levels, and so on. In fact, SOHIO has not only had to deal with a horizontal but also an extensive vertical decision matrix. Specifically, the SOHIO experience should serve as the "lesson" for developing an effective but simpler public participation process for decisions in California.

MOSIER: The observation I made was that the kind of public participation we encountered in California during this particular project is such that I question whether significant projects of any kind could proceed. That's not to say that I and SOHIO are completely negative about public participation. I'm talking about the degree of it, the process that we encountered, and the result. I don't fully agree that it could have been resolved with good foresight, because it was used principally as a vehicle for politicians to obtain their own objectives. The point is that public participation, if it is not carefully administered and utilized, can become a vehicle for political expendiency at all levels of government.

NATALIE LOBE, Department of Energy: My group is interested in gathering information on mitigation, and therefore, I'm very interested in the discussion here. I'd like to ask two short questions, one

primarily directed to Mr. Jones and the other to Mr. Ahern. It's not quite clear to me, Mr. Jones, whether your group's stand is against the project altogether or for a modified plan.

SMUTNY-JONES: That's actually a very good question because there seems to be a real break in the group, with one side saying that we should cut the best deal and the other saying we should hold out. So that hasn't been decided, but I think it will become clear in the mitigation proceedings on the sulfur dioxide scrubbers. There's real concern among people in Long Beach because we don't receive any significant benefit from those scrubbers but are, in fact, the primary impact zone for them. There's a critical issue there. But for the sake of argument, let me say that we continue to oppose the project in its entirety.

LOBE: Mr. Ahern, having come recently from the Department of Energy, where models abound, and having also spent many more years with state and local government, where things are done a little differently, I'd like to ask how you would suggest we avoid letting decision-making on energy facilities become part of a modeling procedure. You're very articulate about what you don't want, but I'm not quite sure what the alternative is.

AHERN: Well, as you probably know, within the Department of Energy there are disagreements about these policy matters, and the modelers at one level will push what the model says the decision should be up to a higher level and get reversed for various reasons. In fact, I remember Secretary Schlesinger's judgment that the model wasn't worth a damn -- I believe that is what he said. I can't remember what magazine it was in, but it was very interesting. I don't think models can quite do it. What I think would solve this problem is for the agency that's charged by Congress with taking care of national energy supply and demand to actively participate in these project decisions. For example, Secretary Schlesinger appointed Doug Robinson as a coordinator to follow the SOHIO project. This is a part of public participation, too -- the involvement of other agencies that have things to say about your decision. Robinson would not testify as to the national interest implications of this project in front of our commissioners, who had to weigh the energy needs against the coastal impacts. So although I would not want a printout of a model when we had to deal with national energy, we certainly would like a representative of the Department of Energy, which we naturally look to for national energy implications of this project, to develop an internal position about it. And we would like to know what that position is and the rationale for it. But that means a federal agency -- having thrashed through its own internal bureaucratic processes and figured out what Congress wants -- coming down and telling us not what to do, but what they think we ought to do and why. That face-to-face contact would be much more helpful than a model.

STEPHEN THOMAS, Political Scientist, Harvard School of Public Health: I am one of a group of people who have been looking at this project for a year or so in connection with a case study that we've been doing for an annual executive education program at the Kennedy School that we jointly sponsor.

What strikes me about the "what are the lessons of all of this stuff" discussion is that in different ways, Mr. Ahern and Dr. Bright are raising issues that seem to imply, at least to my ear, stronger government. Perhaps more centralized government, or at least simpler jurisdictional relations. If that's so, then I wonder whether Mr. Mosier and Mr. Smutny-Jones like the prospect of a stronger government coordinating a project of this kind.

Let me rephrase the question, perhaps in a more complicated way. Public participation as we know it seems to be one response to governmental incapacity, either because agencies are suspect or Congress is regarded as incomeptent or states are regarded as too narrow in their views. Public participation isn't new to democratic govenment; it's just a response to the way in which traditional democratic institutions have been operated.

Then if large-scale, complex, multi-jurisdictional projects of this kind find that the new modes of public participation are getting in the way -- we could disagree about how they've been getting in the way, but they're making it much more difficult to find the person or agency that can deliver the goods -- does that imply that we ought to look again at more traditional ways of involving the public, namely, legislatures, executives, and more centralized modes of government? It's not clear to me that either Mr. Mosier or Mr. Smutny-Jones would entirely approve of that conclusion. But I'm not sure what alternatives there are between, on the one hand, more centralized, effective government to match stronger corporate entities and more capital-intensive, long-term projects and, on the other hand, continuing with fractured jurisdictions and irresponsible division of agency power.

MOSIER: That's difficult. I guess I'm trying to sort out whether obtaining clearer, much clearer, legislation and better-defined roles of various agencies and greater clarity in the regulations -- which I feel are necessary -- imply stronger government. I'm not certian that the weakness of government, in the sense of diffusion of responsibilities in the state, was as big a problem as the lack of clarity in basic federal legislation, followed by interpretations by state and local regulatory agencies and the proliferation of convenient rules all during our process. We didn't go into a situation where the rules were established; they were being developed in mid-project. And if we pursued a course of action within the framework of existing rules, a new set of rules was applied.

What we feel would be important in this thing is to have more clarification, more precise legislation, rules which are not ambiguous. Because when public participation comes into play, they've got a wide open field. The regulations are so unclear that they could take on any

issue, and frequently do. And we're completely vulnerable.

I don't think all of that means stronger government. I'm not particularly advocating a centralization of the responsibility for the decision-making process as a way of life, but I do feel unless we have much more clarification of the rules and regulations, what in effect will happen is that those things which are genuinely determined to be in the national interest will, in fact, be designated on a centralized government basis. Public participation will, in the end, destroy itself. It won't exist.

SMUTNY-JONES: I hope I'm not alone at this conference in believing that public participation isn't facing an immediate crisis of such intensity that we're going to see a stronger central govenrment; I just don't believe that is the case. I do agree with Mr. Mosier that federal legislation and state legislation is generally vague, and it's probably vague for a reason. The only way you can get anything through Congress and the state legislature is to keep it vague. That may be one of the key problems we're facing here. I don't believe that a central government authority, whether that be federal or state, is the best solution, because I think it's difficult to see what some of the key local or regional issues are from far way. There is a very difficult problem there of weighing regional problems against national problems. I understand that, but I don't believe many of these decisions can be made in Washington or Sacramento without getting actively involved in some sort of political dynamic about where this particular project is going to go.

What I'm saying is that the public participants are, for lack of a better word, legitimate actors in this sort of process. I use that word reluctantly because I hate that kind of catch word. But that's exactly what we are; we're part of a process, we're not the end product of a process. We have our concerns and the Secretary of Energy has his concerns, Mr. Mosier's company has its concerns, and somehow this is all battled out and we end up with something which will either be the SOHIO Project or won't be the SOHIO Project or it will be the SOHIO Project in some equally unpalatable fashion. Neither Mr. Mosier nor I nor Mr. Ahern and Mr. Bright wil be totally happy, but we'll end up with something that gets us somewhat closer to a solution.

I'm concerned about the idea that's been expressed that we elect the legislature for a reason, and that is to make these decisions. I think if we've seen any lack of leadership in this country, particularly in the energy end of things, it is with the legislature. When you're talking about public policy, I don't think there's any one right answer. There are a number of answers, and I think it's very important to remember that we do live in a democracy and not a technocracy, and that those decisions need to be made in the open and to go through a process of public participation so everybody gets their say.

AHERN: In no way, shape or form did I advocate stronger government with respect to projects like this. In fact, that was my fear when I

went through that future scenario of the Department of Energy putting everything into their model. However, it's the trend that I see, and I'm frequently conflicted on it. Usually I'm afraid of it, as when, for example, our legislature finally had to make a one-stop shopping decision on a liquefied natural gas terminal in California. It was clear that was going to be hung up in local governments and state agencies for years, and the legislature gave the whole jurisdiction to the California Public Utilities Commission. The Coastal Commission was left to handle a few complicated things, like ranking sites and sending the results over to the Public Utilities Commission, and they ran right over us in the rush to get Indonesian LNG to California. The California Energy Commission is another one-stop centralized place where you're supposed to go for power plants, and there's a lot of agonizing going on right now as to whether that commission should be done away with because its procedures got so complicated, and also because it's so difficult for the public to participate in Energy Commission proceedings because they're quasi-judicial and highly legalistic and wind up being very complicated.

It's a trend I definitely see in California when projects get "delayed" -- I'm not sure what the word "delayed" means; we could discuss that for a couple of hours. But the legislatures sense frustration and say, we've got to cut through all this red tape and give this ball to one agency and let them decide it. I raised this issue from fear, because I see the Coastal Commission and, let's say, California's values that protecting the coast is more important than other things, getting run over by this pushing of decisions up to stronger, higher levels of government. So sometimes I don't like it; sometimes when I'm sitting there in my office dealing with one of these projects I just wish Schlesinger would decide the whole thing.

BRIGHT: I don't think the answer is really stronger government, but rather, it's a squeezing of the process vertically. In so many instances the process itself is the god, and the goal of getting something done isn't even considered.

The key point is that we must "squeeze" the process into something that allows for reasonable progress that adequately considers major problems on a priority basis, and that still allows for effective and reasonable public participation.

JOHN BANTA, Conservation Foundation: I would like to pursue the consensus point further. It seems to me that you all agree that we're in -- at least for SOHIO -- a decision-making process that will require consensus for final approval, if that comes about. It's a multiple veto process. Don Bright started to describe some initiatives that have come out in response to the SOHIO situation for generating consensus on a position. Where are those initiatives coming from? The supporters of the project should have been trying to address that positive fact, rather than emphasizing the media and the divisive decision-making techniques in institutions.

BRIGHT: As I pointed out earlier, California is still on the cutting edge of effectively using public participation. Using it as an efficient tool will take more experience.

The SOHIO state Agency Task Force also illustrates a consensus process. The concept was precipitated by the Port of Long Beach and the Public Utilities Commission, together with strong efforts from the Governor's Office for Planning and Research. It was a new venture. It has proven to be effective, and it's being used on other projects.

Finally, many legislators and directors of State agencies are using the task force concept to develop legislation, revise administrative processes, and define agency jurisdictional poles on various projects and plans.

GUSTAFERRO: We've spent some time worrying about whether or not we could build a stronger federal government, but I would submit to you that we really don't know how to build one. A larger federal government and a stronger federal government are certainly not synonymous. I commend to your reading Opinion Four, which recently came out from the ERA on El Paso's request for LNG, in which the gas would ultimately come out to the State of California. If one had followed the proceedings there and had some of the staff people testify before Mr. Ahern and his Coastal Commission, one would agree with the administrative law judge that the project would go through and that the subsequent FERC analysis would go through. We in the Department of Commerce were under the impression that yes, this is a good project and it meets the national energy needs. Yet, by the time the opinion finally came out in December of last year, it was completely reversed -- the whole concept was changed.

So I submit that this is not necessarily a stronger, but only a larger federal government.

MARTIN: I wonder if I could ask Messrs. Ahern, Bright, and Mosier whether from each of their perspectives they consider a decision on one or more of the permitting processes that the project may not go forward an acceptable outcome in principle. Much of what you've each said seems to assume that it is preordained that a project should be approved, and your comments about public participation seem to depend on whether it's efficient, satisfactory, or esthetically pleasing to you.

AHERN: Briefly, no. Our commission denies projects all the time, in fact, at every meeting, frequently with the assistance of public participation. The commission has definite policies to protect the California coast, and if a project violates those policies it gets denied. That happens all the time. There's no preconceived notion in our agency that a project should go forward.

BRIGHT: The final approvals of the project will be based upon whether appropriate mitigations and conditions can be evolved that satisfy the concerned agencies. There is no way at this point you can

be sure of project approval. Each of the critical environmental reviews that remain have "thorns." For example, the SO2 scrubber that has been proposed as an air quality trade-off has been accepted by many politicians, but it has not been reviewed under required environmental laws. It's a politically expedient answer at this point. And until the environmental evaluation is completed, I think it's really difficult to say that the project will or will not go forward. That uncertainty must be very disturbing for SOHIO.

MOSIER: For the record, the scrubber wasn't proposed by SOHIO, but by the CARB. It was reluctantly accepted by SOHIO as the trade-off package. Now, I'd like to ask, what should finally determine whether a project is approved? If it complies with all the regulations, is technically sound, and is shown not to be an environmental threat in the judgment of all those who've studied it, if it's adequately financed and makes a contribution, what should the basis be to determine whether it should proceed? If a small minority attacks the project with nothing more than their attitudes about the process -- which they're perfectly entitled to do -- does that mean the project should not proceed? It isn't a question of whether every project should be approved or not. What should be the basis for the decision process? That's what we've been trying to determine for four years.

GEORGE PETERS, State Department: I'd like to ask Mr. Bright and Mr. Ahern how the interagency process in California might be related to the permitting process. Couldn't they be put together, and wouldn't this achieve some of that compression that you're talking about? I'm a little confused by Mr. Mosier, who says that SOHIO will do anything that it can to meet any requirement laid on it, and yet I'm told that the storage tanks are an issue. Why not just move them? I'm very interested in seeing how the process can be approved -- in the Coastal Zone Management Office, that's part of our business. It does strike me that the federal government could learn, as the California officials apparently have, that they should get involved in large projects on a high level at an early stage. And the state Interagency Task Force might also involve the federal government and might also be more directly related to the decision-making process. Then you might have the compression that obviously we all need.

BRIGHT: I think two things have happened recently that answer your question. First, in January 1977, the California Environmental Quality Act was amended so that all the concerned agencies receive early notice about a project. In turn, they must reply as to what they require to be included in the environmental review. This amendment also limits the time for review to one year. This should compress the process and increase interagency involvement.

Second, on very complex projects that require federal action, memoranda of understanding are being executed so that the lead agencies, in preparing the document to meet California requirements, participated

on a quid pro quo basis with somebody from the key federal agency. In SOHIO's case, they paid about four million dollars for an EIS and about three for an EIR. Those two documents could have been compressed into one to save an awful lot of time and money. This process of memoranda of understanding where an EIR/EA is being prepared is resolving part of that.

So those things are beginning to occur and I think ultimately they will be the stepstones for further refinement of the process.

MARTIN: I'd like to try to answer Mr. Mosier's question. First, I'm enormously sympathetic to what you and others have said about the lack of clarity in the laws and regulations that constitute the governmental decision-making environment within which a company seeks to get decisions on all these various permits. But if you start with the premise of much of the discussion here that the legislative process has often by design refrained from giving clear answers to what the policies should be, I'm not sure you should be shocked that small splinter elements can stymie the decision and result in a no-go decision. The other side of that coin is the amount of law on the books that's quite clear and specific, but which I think no one would argue reflects a political consensus of the society. The notion that our democratic political institutions produce decisions that are always reflective of broad consensus I think is patently not the case. So in a badly designed buck-passing by legislative bodies, splinter elements that are not reflective of a broad democratic consensus are capable of stymying the decision process. But that's just the other side of the coin of what happens affirmatively in legislative bodies all the time: that special interest groups succeed in creating an impression that a decision exists that reflects broad democratic consensus.

SMUTNY-JONES: I think the real issue, from our point of view, is that the law exists now and that environmental groups, whatever that means, are strong enough now that energy companies, here specifically SOHIO, are being asked to be accountable for some of their external costs that historically they haven't been made accountable for, whether on a specific Long Beach area or regional issue. I don't believe us to be a small minority that should be sort of steamrolled over, and by the same token I don't believe a small minority group of people in Long Beach exercise an overwhelming amount of power over this project. I think we are simply holding the governmental agencies and the corporation accountable for what the law dictates.

MOSIER: I feel I must respond to the implication that SOHIO has been reluctant or unwilling to carry out this responsibility. People constantly create a dichotomy with environmentalists on one side and business on the other; that is absolutely false. There are as many environmentalists in our company as there are in Long Beach, or about on a proportionate basis to the population.

Second, I mentioned earlier that the emission levels for our project

were determined to be almost immaterial, but nevertheless, we accepted an accommodation with the agencies on an emission level ten times greater than those that could, by any modeling process, be attributed to the project and agreed, against a case which didn't even recognize the fact that the tankers we're talking about are already there. They aren't coming in new. In fact, there are two there now for every one that will be there when this project is put in place.

The facts are that if the scrubber didn't work at all it would be immaterial, in light of what the issues are. But the scrubber will work and the people at Long Beach will benefit materially as a result of this project taken against the base case which currently exists. So we are not, in any sense of the word, reluctant to carry out a responsibility for cleaning up the environment, regardless of what we as a company thought about the extent to which we affect that environment. We've agreed to do that and are prepared to do it, and that is not the issue. It's the excuse, but it isn't the issue.

CASE III: LOUISIANA OFFSHORE OIL PORT

CASE TEAM

Stephen J. Masse, Leader
Chief, Engineering Staff
Deepwater Ports Projects
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STEPHEN J. MASSE

Chief, Engineering Staff
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INTRODUCTION

I would like to begin the story of the Louisiana Offshore Oil Port, hereinafter to be called LOOP, with a little historical data. In the years since World War II, the size of tank ships has increased dramatically, and in the course of their development, they began to outgrow conventional terminal facilities. Alternative transfer facilities that were developed to serve these so-called supertankers or very large crude carriers are deep draft ports, lightering, transshipment, offshore sea islands, and deepwater ports.

By the early 1970's, there were a number of deepwater ports in Europe, Asia, and Africa, but the U.S. was just beginning to show an interest in such facilities. Among the studies done during this time was one by the Corps of Engineers that pointed out the potential for deepwater ports on the East Coast, the Gulf of Mexico, and to a lesser extent, the West Coast. Planning for deepwater ports was begun in Massachusetts, Delaware, Alabama, Mississippi, Texas, and Louisiana. However, only LOOP and Seadock, which was the project in Texas, got to the stage of actually submitting applications for federal licenses.

The Superport Task Force, which was set up in Louisiana in February 1972, led to the establishment of the Deep Draft Harbor and Terminal Authority, later changed to the Louisiana Offshore Terminal Authority. The Authority set out to build a public port, but by 1975 changed its focus to the licensing of LOOP and the protection of the environment.

Congress began hearings in 1973. There was a great deal of interest in the legislation; there were six bills in the Senate, the Administration floated a bill, and there were bills in the House. The Deepwater Port Act was finally enacted in January 1975. The act gave the authority for granting of deepwater port licenses to the Secretary of Transportation and charged him with coordinating all federal licensing actions.

LOOP, Inc., was formed in 1972 by ten oil or pipeline companies. Their original hope was to begin operation in 1976. Progress, however, had to await the passage of federal legislation and the development of regulations. Coast Guard regulations became effective in November 1975.

LOOP, Inc., then consisting of six companies, and Seadock submitted applications in December 1975. During 1976 the Coast Guard and the Secretary of Transportation processed the applications, prepared the EIS, held hearings, and coordinated the inputs from all federal agencies. The Secretary published his decision and a 25-page license document in December. LOOP and Seadock then had to decide whether or

not to accept the licenses. By July of 1977, Mobil, Exxon, and Gulf had withdrawn from Seadock. The remaining Seadock members eventually deferred to the Texas Deepwater Port Authority, which now has an amended Seadock license before the Secretary.

LOOP, consisting at this time of Marathon, Ashland, Murphy, Shell, and Texaco, accepted the federal and state licenses in August 1977. Since then, LOOP has been hard at work in the design and construction of its port. At present, offsite fabrication of components and drilling for salt caverns are underway. The first oil movement is scheduled for late 1980.

In brief, LOOP, Inc. is a crude oil importation project consisting of an offshore terminal 18 miles south of Grand Isle, Louisiana, with pipelines to an onshore terminal 30 miles ashore in an area southwest of New Orleans. The temporary storage of the onshore terminals consists of caverns that have been leached from naturally occurring salt domes. The onshore terminal will connect to local refineries and to a pipeline system that serves much of Central United States. The distribution system from the offshore terminal in the Gulf of Mexico to the Great Lakes is shown in Figure 1.

The offshore terminal will consist of a pumping platform and a control platform, encircled by single point moorings. The pumping platform will look something like the one shown in Figure 2.

The initial phase of the project will consist of three single point moorings, like the one shown in Figure 3.

The heart of the system is a ship tied to the buoy. Hoses are attached to the manifold, and they come down to a swivel at the base of the single point mooring depicted in Figure 4. So as the ship rotates, the hose follows.

In the completed project, there will be six single point moorings for oil tankers and three crude oil pipelines. There is a 16-mile pipeline system across the Louisiana Wetlands to the onshore terminal.

To construct the salt caverns that will be used for temporary storage at the onshore terminal, water is forced in to dissolve the salt and a brine is discharged as is shown in Figure 5. In the operational stage, there will be a continual fluctuation of crude oil floating on the brine, and a big reservoir will hold the brine.

The onshore terminal will connect through a 53-mile pipeline to Capline, on the Mississippi River. Figure 6 shows an aerial view of the Capline Terminal, from which the crude oil will be shipped to refineries in Louisiana and throughout the midsection of the country.

The capacity of LOOP will be 1.4 million barrels a day in the initial phase and 3.4 million barrels at the completion of all phases, contingent on the requirement for and initiation of the future phases.

So that is LOOP in a nutshell. William Read, who is the President of LOOP, will talk about the project.

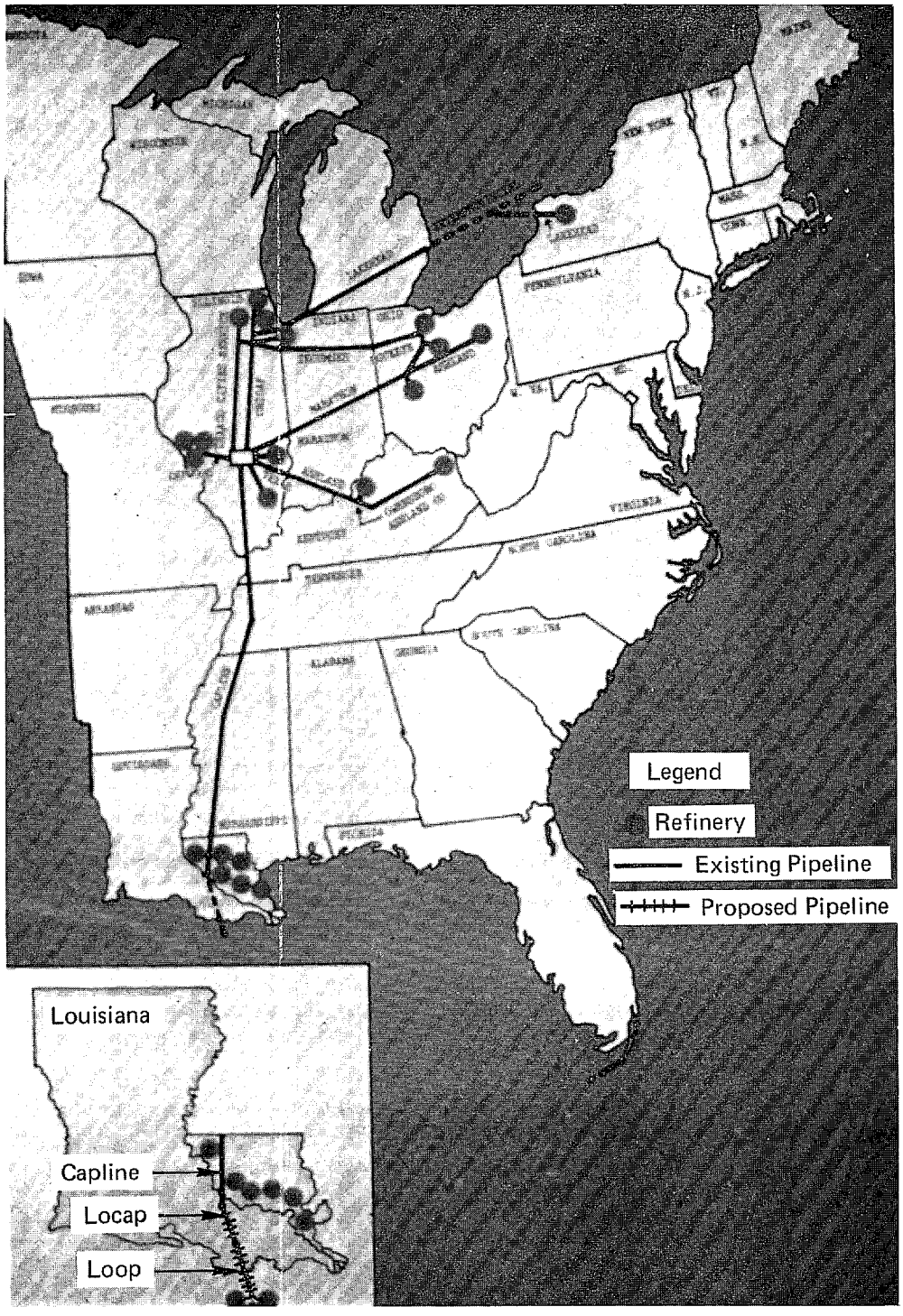

FIGURE 1. Louisiana Offshore Oil Port System, from offshore terminal to Central United States distribution points.

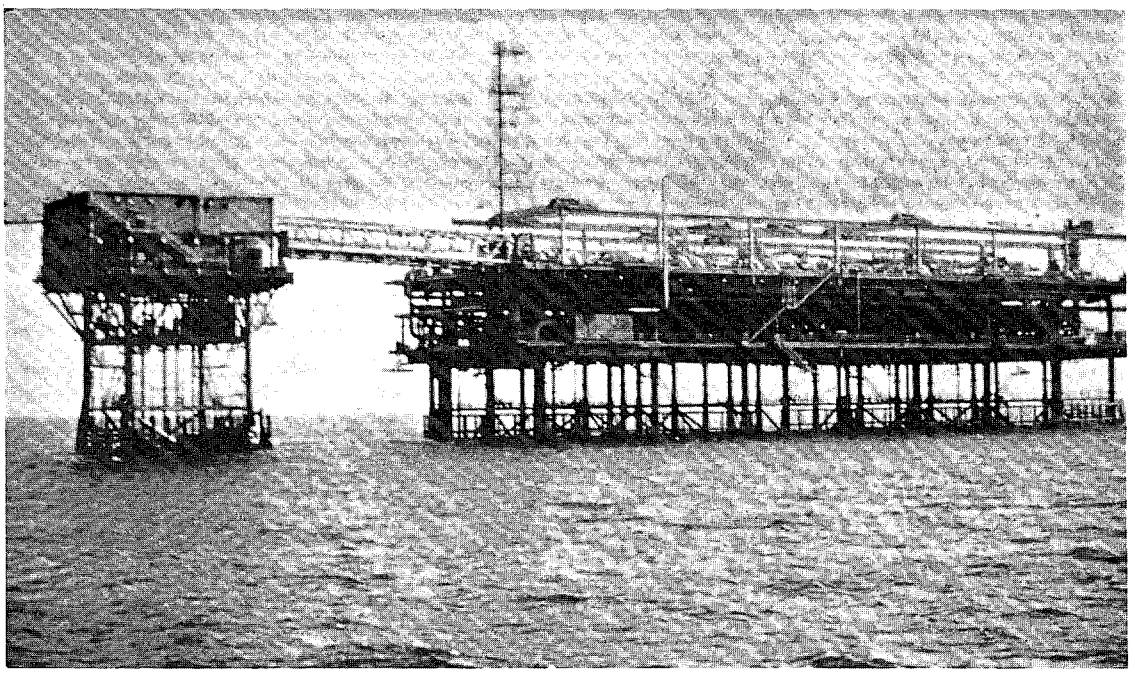

FIGURE 2. Typical offshore platform complex.

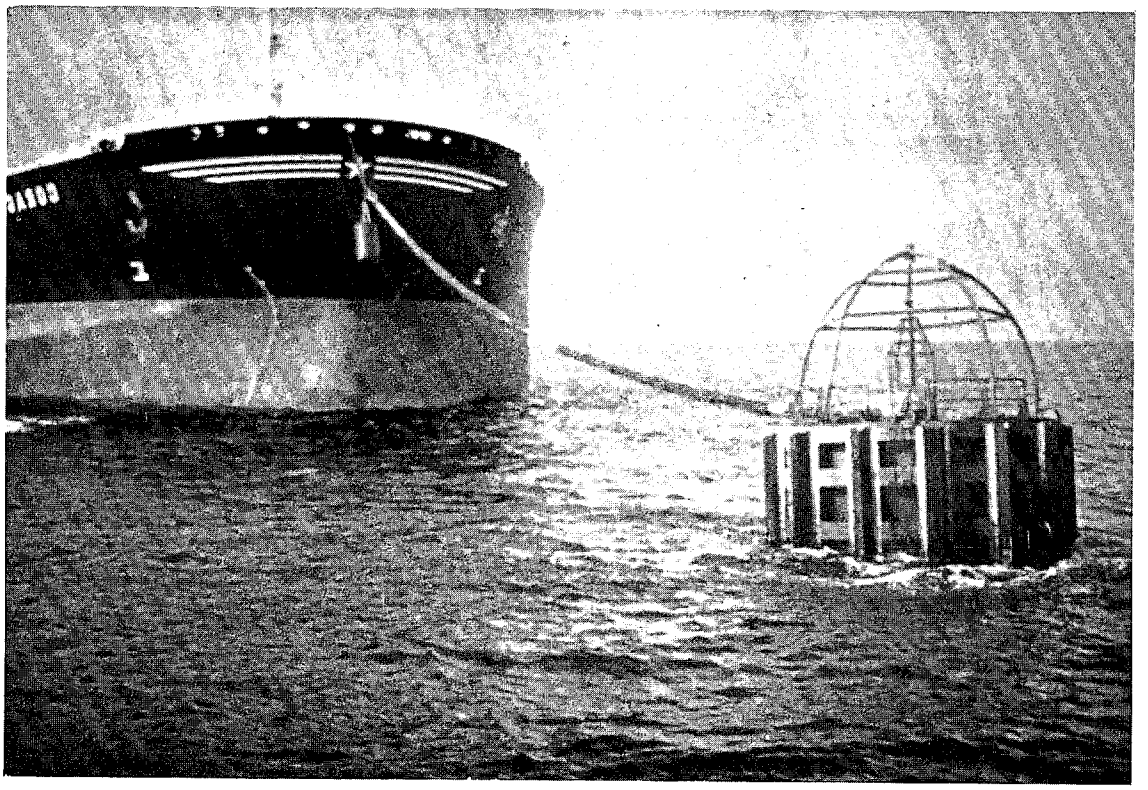

FIGURE 3. Tanker moored to a single point mooring.

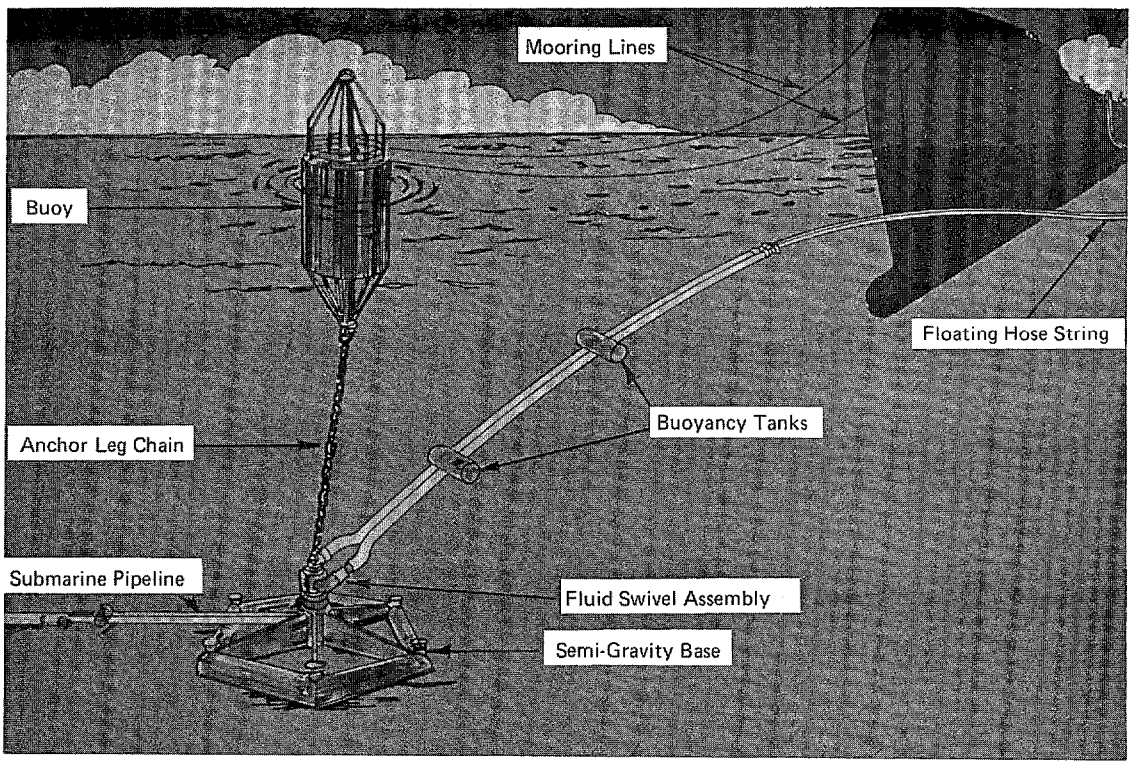

FIGURE 4. Single Anchor Leg Mooring.

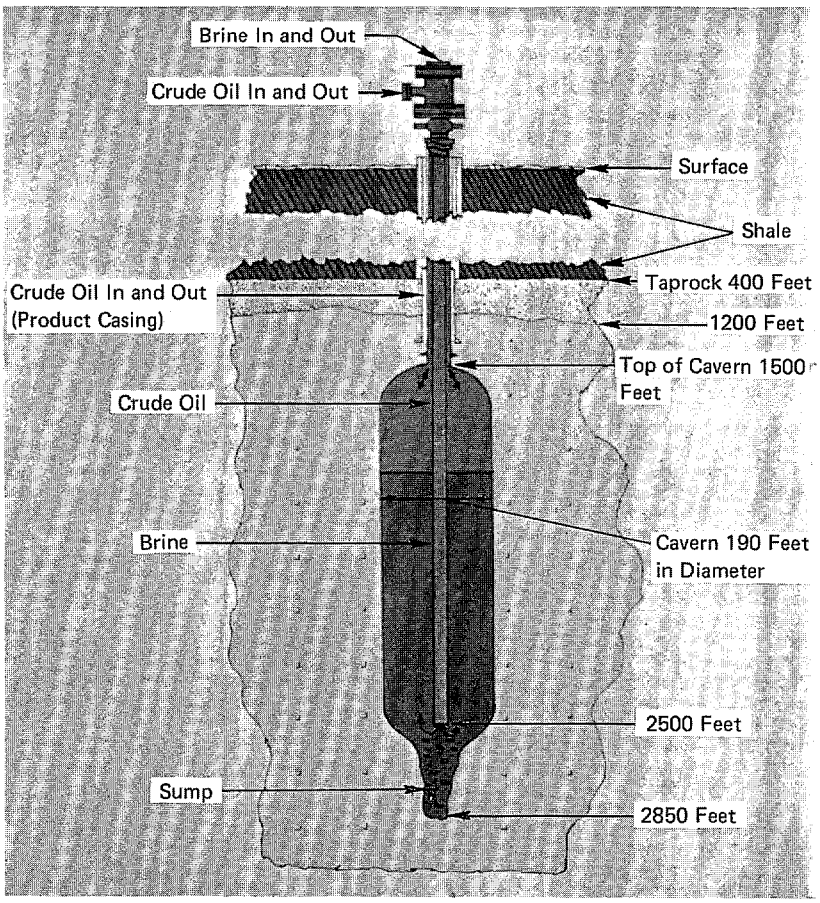

FIGURE 5. Salt storage cavern, cross-section view.

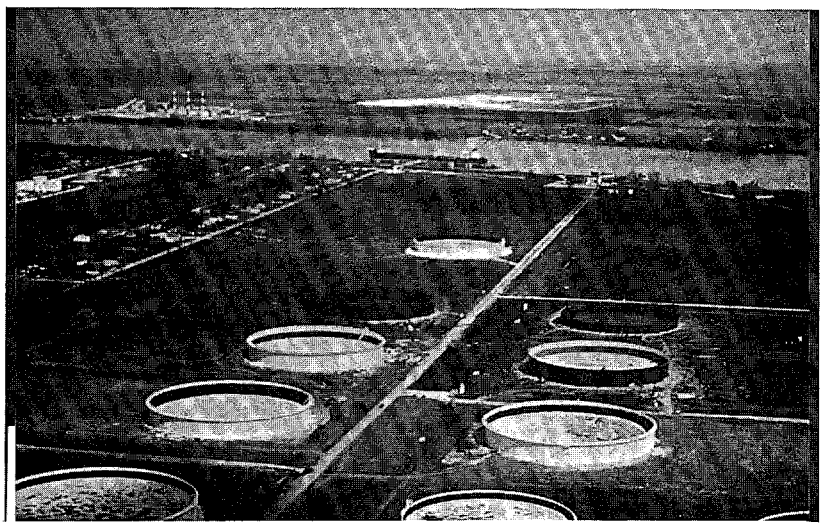

FIGURE 6. Capline Terminal, aerial view.

WILLIAM B. READ

President
Loop, Incorporated

I am a civil engineer, and I have worked for Marathon Oil Company, one of the major shareholders in the project, for almost 30 years. My experience has been in building pipelines and in crude oil trading and transportation. In October 1972, when the decision was made by the shareholder oil companies to proceed with the project, I was loaned by Marathon to LOOP and served as the president of the corporation, which is a joint venture corporation owned by five oil company shareholders. I have been working on the project continuously since October 1972, through the legislative effort, through the environmental planning, through the licensing process, and now in the construction phase of the project.

We are in the process of spending money building the port. We have four drilling rigs operating right now on the salt dome, drilling the access wells. We intend to start leaching out the salt sometime this summer. The offshore platform is being fabricated. We should be ready to start construction activities on the onshore pipeline next month. Our offshore pipelines will be laid this summer. If everything goes right, we will be unloading the first tanker in September or October of 1980.

LONELL JOHNSON

Antitrust Regulations Specialist
Office of the Secretary of Transportation
Office of Deepwater Ports
Department of Transportation

I have been associated with the Office of Deepwater Ports since late 1975. I served for a year as the Acting Director and have been involved in the processing of both the LOOP and Seadock license applications. I am currently associated with the regulatory phase of the LOOP project.

The Secretary of Transportation organized the functions of deepwater ports so that the technical functions are the responsibility of the United States Coast Guard, but he reserved certain functions for his

staff. The Office of Deepwater Ports, with a small staff working together with the Office of the General Counsel, dealt directly with the Coast Guard and with the applicants, their affiliates, and the other federal agencies to expedite the processing of the license application and make sure it would be consistent with the goals and objectives of the department and would not exceed the time frame set forth in the law. The 356 days stated in the Deepwater Port Act is the period within which a license must be accepted or denied.

We had originally expected the problems in the processing of the deepwater port applications to revolve around environmental questions and the question of citizen participation. However, the antitrust review and the antitrust concerns proved to be the most difficult part of the licensing process. The deepwater port legislation provided for the Attorney General of the United States and the Federal Trade Commission to give the Secretary advice on the anti-competitive aspects of deepwater ports. An invitation was extended to the antitrust agencies to participate in a joint investigation and fact-finding effort. The resulting information was used as the basis for a report from each agency to the Secretary.

The Justice Department and the FTC recommended a set of competitive rules which any license issued in the case should follow, and the Secretary incorporated most of these recommendations into the LOOP license. In the course of our dialogue today, perhaps we can get into some of those specific issues. We have with us in the audience representatives from the antitrust community, and together we might review the manner in which the successful investigation and licensing that will put LOOP into operation by 1980 has been accomplished.

SHEPARD F. PERRIN, JR.

Executive Director
State of Louisiana Offshore Terminal Authority

I am a chemical engineer. At one point, I had four years at sea with the United States Navy on a heavy cruiser. At that time we refueled from 8,000-ton tankers while we were underway, which was my first experience with tankers.

After that, I went into the oil business, and I have had experience in refining, supply, transport, and marketing of petroleum products, both in the U.S. and internationally. My last assignment with an oil company was in Singapore, where we had a single point mooring buoy

system that was capable of receiving up to 225,000 ton tankers. Those do not really qualify as supertankers, but they are pretty big.

The role of the Louisiana Offshore Terminal Authority has changed quite a bit since its inception. In the beginning, the law that the legislature passed in 1972 and modified in 1974 called for a great deal of emphasis on protecting the environment, and an environmental protection plan was called for in the legislation. This was developed with the assistance of a lot of public input. The Board of Commissioners' meetings were all held in public. Louisiana has a sunshine law. There were many people who came and commented on the various aspects, and consequently we feel that the environmental protection program is a good one.

Since my background has been in the oil industry to some extent, you may feel that the state is a little biased toward industry. But on our environmental committee, we have two experts in the environmental field: Dr. Lyle St. Amant, Assistant Secretary of the Department of Wildlife and Fisheries, and Dr. Jack Van Lopik of the Louisiana State University Center for Wetland Resources. So you can see that two environmentally concerned people can outvote me any time I get out of line.

One of the things that the state took a look at was the risks versus the rewards. The risk has pretty well been taken care of by the environmental protection plan and an environmental monitoring program. The monitoring program is being conducted by the Department of Wildlife and Fisheries in the field, and certain studies relative to wildlife, in particular to the fur-bearing animals, the alligators, and the water fowl, are being carried out under Dr. Van Lopik's direction.

With regard to the rewards, we had Kaiser engineers do a rather detailed study in 1976. It showed substantial industrial benefits to the State of Louisiana if the state took full advantage of the economies offered by the superport, as well as the benefits of removing some of the tanker traffic from the Mississippi River and allowing more room for general cargo traffic.

Consequently, the state has made the decision that the rewards are well worth the risks, as long as the risks are completely covered and monitored, as we believe that they are. So we issued a license to LOOP at virtually the same time as the federal license was offered, and it is primarily oriented toward environmental protection.

The role of the Authority at the present time is looking at the engineering design and reviewing the construction of the project, primarily on state lands up to the shoreline. We do have an interest in that portion of the project from the shoreline seaward.

SHARRON STEWART

First Vice President
Texas Environmental Coalition

I am on the boards of a half-a-dozen different environmental groups on the Gulf Coast. I was fortunate enough to be appointed by the President to the National Advisory Committee on Oceans and Atmosphere, and when Seadock, due to the antitrust regulations, withdrew and left the state to build the port instead of private industry, the governor appointed me to the Texas Deepwater Port Authority. Ports both onshore and off in the Gulf have been a main concern of mine since 1971.

I think that what has happened in public participation in LOOP parallels what happened with Seadock. That is, in Louisiana, one out of every ten jobs is associated with the oil and gas industry. Oil and gas reserves in both states are declining. People perceived that LOOP would help that situation, and I think in that respect they were very correct. All in all, public participation worked well with LOOP.

On any issue as big as a deepwater port, there is a great deal of newspaper, TV, and magazine publicity. Publicity of that kind reveals the issues that were identified and discussed. The first issue was jobs. The second was, what kind of secondary development is going to occur? Mr. Perrin talked about the Kaiser Report that weighed benefits and disadvantages of the port. That was perhaps a very controversial report, and I would expect some people in the audience to ask questions about that later.

The third issue that was discussed a lot is how good the port would be for the balance of payments. What may not have been discussed in detail in the early days were things like the risk of the ships coming in either offshore or to an onshore port. What is the spill potential? What about cavern integrity for the storage of oil? How is brine discharge going to affect the fisheries? What is the ability of the fishermen to use the safety zone?

Now, some of these questions were attacked by the Port Authority and by LOOP. There was a great deal of base built up both with the organized and the unorganized public. The ability of the officials involved in dealing with the public, because they appeared to be concerned about what they were talking about and to be trying to work out solutions, was considerable.

The one thing that ought to be understood for both LOOP and Seadock is that there was never really any question about whether a deepwater port would be built. In 1974 or 1975, that was not an issue in either state. The issue was when, where, and how, and that is where public participation was involved.

Initially, there was the possibility of an onshore competing port in Plaquemines Parish. It was decided after a great deal of environmental

investigation that this was not the proper way to handle this particular problem. That project was dropped in favor of LOOP.

JACK R. VAN LOPIK

Dean, Center for Wetland Resources
Louisiana State University

I am a geologist by training and I guess that qualifies me to deal with issues such as ecology and environmental problems. I have also worked for the Corps of Engineers for about seven years at the Waterways Experiment Station in Vicksburg, Mississippi, and I spent about seven years with Texas Instruments in Dallas before coming to LSU. So from the standpoint of the three corners of the government-industry-environment triangle, I have run out of corners. Recently, however, I have been involved in a nonprofit research organization in Louisiana on its board of directors. And I can certainly tell you that none of these three sectors has a corner on objectivity or wisdom.

My involvement with LOOP goes back to about 1972 in various capacities. First of all, my group at the Center for Wetland Resources at LSU contracted to conduct the environmental assessment for the LOOP program. The assessment involved the collection of about a year's worth of field data and other material to be used in the EIS, which we did not prepare.

I was also involved with the development of the environmental protection plan that was an integral part of the Deepwater Port Act passed by the state. Since that time, we have contracted to do some work related to the monitoring program for vegetation, water fowl, alligators, and fur-bearing animals. This is in cooperation with the Louisiana Department of Wildlife and Fisheries.

I also function as one of the three Environmental Directors for the Louisiana Offshore Terminal Authority, along with Lyle St. Amant and Shep Perrin, and I have overview responsibility for the environmental aspects of the development of LOOP.

Regarding involvement of universities or scientists, the environmental groups and the oil companies perceive scientists as very objective and unbiased individuals, and therefore they came to the university to get the input they wanted. I really don't believe that, however. The best we can hope for is that within an institution or a group, we may have a balanced mix of people, and that the final product will at least reflect each of these various special interest groups. We employ people who are very active in environmental activities. We have

other people that are more conservation-oriented, as they prefer to call it. And we have some people who are in favor of economic development at all costs. So what I get involved with, even on an internal basis, is balancing these views and trying to come up with an objective product. When studies go beyond fact, as they often do in cases like this, this becomes very difficult.

There is the question of the university role in all of this, and I am especially interested in how the university might work through the Sea Grant programs or other means to develop better public awareness. The university, because of its diverse faculty, does provide for public participation activity within a project such as LOOP.

MASSE: I want to recognize Dr. Lyle St. Amant, who is a member of the program committee and who has been a part of getting the LOOP project before you.

LYLE ST. AMANT

Assistant Secretary
Louisiana Department of Wildlife and Fisheries

Well, before the audience thinks it was all that easy, let me point out a few things about the LOOP situation. I was in it from the beginning, and it worked out well because a great many people spent a lot of time, and in many instances did a lot of head-knocking, to get the thing done.

The background of the system might help you understand it a little better. In 1969 or 1970, the environmental movement became active in the country. There was environmental work before that, but it was between competing interests, and I had been under the gun for years between the fishermen and the oil interests. They had been miles apart on the development of Louisiana, and there had been lots of oil wells. By some kind of machination, we managed to get some of both, and most people were satisfied.

So when early representatives from LOOP came to me and said, "Can this be done?" I said, "Well, from a practical standpoint, yes. There are many pipelines across Louisiana. Yours is no different, and if you want to follow the systems that we use, there should be no problem and no real environmental damages associated with it."

About this time the environmental issue was surfacing, and there was a great deal of public interest. It became apparent that from a national standpoint this was going to be one of the first sea docks and

offshore ports, and that it was going to be scrutinized.

This led to the legislation that set up the Deepwater Port Commission, and I think people who are interested in this should take a hard look at this legislation and perhaps at the resulting environmental plan and environmental monitoring system. I can't tell you the number of hours we sat down and worked on this plan. Finally we would get it knocked out. Then it would have to go to the Commission for public participation, and anybody else who wanted could have a shot at it.

There were two keys to success. The first was legislation. Objectively, I wasn't going to get anything out of the oil companies. I was much more under the gun from the fishing industry, because if I didn't protect their interests, I could be considered off base.

The other thing that nobody has mentioned on this platform is that somebody footed the bill for this thing. You can get all kinds of environmental suggestions from people in the public, but when you go out to get the baseline data, and then monitor it from day to day, it costs money. It takes nearly $400,000 a year to do this work, or one-fourth of what I spend in my total marine budget in the State of Louisiana. LOOP is footing the bill for about $500,000--that is our ceiling, and we argue about this from time to time. But it was in the law that somebody was going to pay for this.

The Department of Wildlife and Fisheries is doing the day to day monitoring. There are two parallel sections, the ecosystem problems and the construction problems. Right now we are doing construction monitoring, trying to see that the actual digging, dredging, and placement, the way the pipelines are laid out and so forth, are going to cause a minimum amount of damage. We have done this for 30 years.

We had to go in and talk to the oyster fishermen, we had to examine the oyster leases in advance, to examine them after the fact, we have to determine whether we have any silting. If you do it right, you can mitigate the problems and you can certainly stop most of the litigation that would come from this type of thing.

Sometimes rather curious things come up. The LOOP engineers, for example, planned to float their pipelines offshore. First, they were going to put them together in three- or four-mile sections in the canal. The problem here was not environmental. The problem is that these waterways are used, day and night, by fishermen, hunters, high-speed boats, and oyster boats, and we could have had four or five miles of pipeline stretched across the marsh, blocking passage until somebody decided to haul them out to sea.

It means we have to be on it day to day, and I think LOOP is unique. I would like to think that all environmental disturbances could be handled this way. I don't know whether they could be, because it did take a lot of time and an exceptional amount of money.

The monitoring team, which is, I guess, me and whoever is working with me and Jack Van Lopik, really has a pretty good bit of muscle. If we walk out there and see something going on that is going to affect the environment drastically, we have the right to shut this operation down until we get it straightened out. Now, this is an awful lot of power

and an awful lot of responsibility. But I have shut down oil wells, and it gets a lot more action than fining somebody.

They were willing to give us this responsibility provided we were able to handle it in a proper way, and I expect to do it that way. But I have assured them, and I have assured the public, that if something goes wrong, we are going to have to take a look at it, because that is what the public demands.

I think the reason we had so little problem with public objection to this project in Louisiana is because we made this promise and they have us in a position where we have to keep it. Anybody in the public or the professional areas knows that they can come to us with any data they think they have about a problem developing in the ecosystem from this operation, and that we are in a position to take a hard look at it and make the necessary adjustments.

After working with this for years, looking at the pipelines and the way they are set up, I don't anticipate any real problem. The only thing we don't really know is what is going to happen with salt water out there. We do have some experience with the salt water from old stripper wells in shallow water areas. From what I know about this and from the calculations, I don't expect any problem from the salt water brine going into the system, because the dissipation of it is rather rapid. We have not been able to detect anything in some of the small units.

We are prepared to monitor this with constant recording equipment and with frequent field examinations around the site. Once we start pumping salt water in this system, if the shrimp crop drops off or the speckled trout quit biting within a mile or two, somebody had better have an answer, because this is the kind of thing that we are going to be blamed for. I feel that now we will have enough data and enough control that if a question comes up, I can stand up in public and make a statement I can back up. This is the kind of position you almost have to be in with this kind of thing.

STEWART: Dr. St. Amant, you need to be commended for the fact that all of this fantastic amount of data that is being accumulated is in a usable form, that the data base for the State of Louisiana is going to increase immeasurably and will be useful for people who are interested in the environment.

GENERAL DISCUSSION

B.H. BRITTIN, Ocean Affairs Consultant: My work has been with the oceans for a long time. I first knew Lyle St. Amant about ten or fifteen years ago. What I was doing then, up until I retired, was involved with the law of the sea and negotiations over the use of the oceans, primarily fishing interests and scientific research communities.

This morning I sat through a panel which had to do with the use of Georges Bank. What brings it to mind is that after hearing all of you speak, it strikes me that with all the disparate interests at play in LOOP, there were accommodations made in order to produce a package that is soon going to be operational. That is quite in contrast to Georges Bank issues. There still appear to be a lot of intractable positions, of people saying, "This is the way it is going to be, or else." In other words, they have not yet reached the conclusion that you who are involved in LOOP arrived at, that accommodation has to be made by the various facets and groups in order to reach a satisfactory conclusion.

So my suggestion is this: This group of people on the platform now should all move up to New England and take on that problem up there.

MASSE: Can Lyle come with us?

ST. AMANT: Let's be honest. The only reason Louisiana is operating is because we have thirty years, if you want to call it, of maturity. We went through every ache and agony that is going on in Georges Bank. I have been in situations where I had to keep people in one office or another to keep somebody from getting shot. I am serious; there were people shooting at each other. But we were dealing then with just two interests, oil and fishing. At least we could put the two of them in a room and get in the middle and arbitrate this thing.

The credit goes to experience. I am sure many of the fishermen in the early days would like to have gotten rid of some of us. Then they found out that even though they objected and the oil companies went ahead, it didn't really tear up all the fish. And a lot of them got jobs with the oil companies, because every year the fish weren't produced and they were pretty well starving back in the Depression days and right after the war. In the early days, the oil people used fishing vessels to haul the gear out, and they hired these people.

So there was accommodation throughout the system, but it came slowly, over a long, long period of time. I do think the East Coast can profit from this thing. I think if they really want to, they can come down and see our mistakes and try to avoid them. We made an awful lot of mistakes. And if I knew then what I know now, and I had anything like the muscle we have now with respect to environmental protection, I suspect the Louisiana coast would be a much different place. But you can't go back and pull up 30,000 oil wells, and you can't go back in some of these oil fields that have been there for a long time and

completely reorganize them. But there is a way to do it, and there are several things that have been mentioned here today that are the real crux of this matter.

First, oil offshore is a lot simpler than it is onshore. When you get into wetlands and crossing marshlands, you almost have to disrupt the ecosystem in some manner or other. Offshore, you are really looking at a physical structure that is, as has been pointed out, no different from a ship or a buoy or lighthouse or something, as long as it is operated properly.

The second thing is the sophistication of the equipment now and the care that goes into developing offshore structures. The offshore group that has worked out the regulations on structures has got them to the point where you can have an accident, but it is going to be a rare instance. Nobody wants this accident.

So the pipeline system, in my opinion, is the safest way to transport oil and probably the cheapest in the long run if you are going to haul a lot of oil.

I would suggest that the Georges Bank people send a team down to go over all the scientific data and go back through the whole system and see if they can find any long-range effect on it. There may be a difference in temperature, there may be a difference in current. It was always my understanding, though, that high temperatures and high metabolic rates would probably show more rapid effects of a toxin than colder temperatures.

There is some evidence that even in chronic spills the biodegradation of oil is rapid enough so that you can't find any cumulative effect. Some of the work that has been done by the Gulf University Group indicates that there was no long-term increase in oil pollution. That is not to say that you don't have chronic problems with it.

PETER HOLMES, Atlantic Coast Project, Natural Resources Defense Council: I hate to cast a sour note on the cordial proceedings, but I represent a group that held one of the intractable positions with the Georges Bank drilling. We were some of the principal litigants against the Bureau of Land Management.

Our position is that we cannot sacrifice infinitely renewable resources such as the fish that we can get from the Georges Bank for the sake of a finite supply of petroleum. After we have exhausted the petroleum and destroyed the renewable resources by not proceeding in an environmentally sound manner, then we are really in the hole for the future.

I remember a supplement to the Washington Post, done with the National Ocean Industries Association, called "America Offshore." It expressed the opinion that drilling could continue in the Baltimore Canyon and Georges Bank with assurances that we had all the Gulf drilling experiences with no adverse impacts.

I am just now starting to study some of Louisiana's problems, and they are pretty formidable, whether you talk about the standard of living in Morgan City or the fact that the Louisiana shoreline is losing

16.5 square miles of land a year, whereas before they were prograding at the rate of about 1 square mile a year, before 1940 or 1930 -- I can't remember the exact year.

I am not familiar with some of the proceedings that went into the environmental impact studies for the Louisiana Offshore Oil Port. However, I have been reviewing some impact statements for projects that are being induced by LOOP, such as the Port Fourchon development plan that has applied for funds under the Coastal Energy Impact Program.

My question is whether in the environmental impact statement for LOOP a lot of these induced impacts were considered, such as the Port Fourchon development. It seems that Louisiana is far from reversing the trend toward coastal degradation, but in fact may be actually on the road to much larger environmental degradation through the Corps of Engineers' navigation projects, increased dredging, and the generally increased traffic load.

ST. AMANT: Nobody ever said that this coastal area of Louisiana was stable or that it would maintain itself forever. What I object to is blaming it on the oil companies, or one specific unit.

The coast of Louisiana has been being degraded since about 1720, when the first levee was built in the state. The entire deltic system and coast of Louisiana and all of the Mississippi River Valley system is based on an annual flood cycle. If we could tear down the levees and allow the river to operate, I am sure we wouldn't have this problem, but we wouldn't have 1.5 million people living in wetlands. I would remind you that 30 percent of the total area of Louisiana is subjected to the 404 regulations of the Corps of Engineers. About 2 million people live in this area. Moreover, they have been living in it for over 200 years.

Several things should be recognized. It is true we haven't had a high river in Louisiana since 1950. This is when the coast began to subside. It can be directly attributed to things that had little to do with the oil companies. It has to do with man, with control of floods, with the stacking up of water in Missouri and Oklahoma for irrigation, with controlling the peak flow to the Mississippi River. It has to do with deepwater ports. When they couldn't get into New Orleans without assistance, they dug some, and every city wants them. I don't agree with this, but this is past history; they are there.

These are the things that break down a wetlands system. I think any geologist would tell you that if man had never moved into this system except to set the levees, the Louisiana coast would go. The Mississippi coast is an example of what happens when a deltic system moves. You would end up with nothing but barrier islands out there over a period of time.

It is true that when you put a pipeline in a wetlands system, the ground begins to degrade and erode away. We have some pipeline canals that were dug on Rockefeller Refuge at 50 feet wide; they are now 300 feet wide.

We try to adjust to this, though I am sure we don't do anything perfectly and never will. But we make them build roads now, plank

roads. We don't let them dig unless they have to. We go in and try to maintain the integrity of the drainage patterns. We try to get water control structures into the system, and these are the kinds of things we are having LOOP do.

I think it is true that it wouldn't look like it does now if we had known all of this. It took 50 years to see what was going on. All I am saying is that if you don't like the mistakes we have made, don't make them in some other area. But I do think that you can profit by them, and I don't think that you have to shut down the whole world in order to handle this.

I would also point out that I don't believe that there is another coast in the United States that is as fragile or unstable as the Louisiana deltic system, with the possible exception of the Everglades in Florida. To try to equate the problems of some of these very delicate equilibriums with those of the rock-bound coasts just won't work.

J. ROSS VINCENT, Ecology Center of Louisiana: I presume one of the things we are trying to do here is learn from the LOOP experience how to handle things like this in the future. I think there are some things about LOOP that are unique and may make it atypical. It would be useful to understand those as we try to apply the LOOP experience to other places.

For instance, whether or not there would be an offshore superport for Louisiana was never a serious political issue. In my experience, a lot of the really deeply felt, controversial environmental issues stem from groups of people who have significantly different visions of the future for an area. That may be the problem on the East Coast.

In Louisiana, in building a superport, we weren't talking about radically changing the economic base of the community; we were talking about sustaining it. The issue of whether to build the port was never a serious political question. There were people who disagreed, but it was never seriously entertained as a viable issue for the public arena, because it simply wouldn't have gotten anywhere.

That brought the issues related to LOOP down to questions of where and when and how you would go about building this port. It made the issues initially a good deal more technical in nature, and at that time the public interest community in Louisiana lacked the technical capability to deal with a lot of those issues. So the citizens' groups were put at a significant disadvantage by the political climate within which LOOP was considered. I think that is going to be less true in the future, because citizens' groups are beginning to develop technical capabilities they didn't have before.

A second point is that, especially in the public works project issues, environmental groups were in the position of trying to relate the environmental risks involved in a project to the benefits to the communities affected. And in this case we were looking not only at economic benefits -- I think some of those were exaggerated in the process of trying to sell the project -- but also at substantial

environmental benefits, which isn't the case in a lot of these public works projects.

I am inclined to believe that the greatest of those benefits is the increase in the data base about wetlands in Louisiana that resulted primarily from the impetus of the LOOP project -- the research that was done in preparing the environmental impact statement, the substantial increase in resident technical capability, the brain trust that has been built up in Dr. Van Lopik's organization and in state government. It became obvious early in the LOOP project that that was going to help the environmental community in Louisiana to deal with a whole host of wetlands-related issues.

Another thing that I think is critically important is the fact that people like Bill Read and Shep Perrin and P.J. Mills were incredibly accessible to the public. In cases of this nature, the executives in government agencies and private corporations are rarely directly accessible. In the LOOP case, citizens' groups didn't have to deal through PR or technical people. The top-level people met directly with the public and established personal credibility with citizens' groups, and that went a long way toward reducing the level of suspicion. In doing that, some might argue they have unduly modified or suppressed potential opposition in some areas of the project. But the people who are making the decisions have to understand what the public is thinking about, and that doesn't happen often enough in these projects.

The final thing is that the accessibility of these officials to the public, the sincerity that they portrayed, and the top quality work that was done in the process of conducting the environmental studies, preparing the legislation, and drafting the regulations, was so atypical in Louisiana that it stood out like the star on Christmas morn. We don't have a strong tradition of public involvement in government. That may be an understatement. The fact that a government agency, a state agency, the superport authority, and a private corporation involved in a major public works project really made themselves available and appeared to be doing top-quality work made a substantial difference.

STEWART: I would like to point out that the environmental community in the State of Louisiana did not just roll over and play dead. The very first decision in this ballgame was based on the fact that if you put the port 18 miles offshore with the pipeline connecting to onshore storage facilities, you have a minimum lead time of 18 hours before a spill at that platform is going to get into the estuary. And if you build a port off Plaquemines Parish or at the mouth of the Mississippi River, you have no lead time.

I recently went through the National Oil Spill Response School, and it was a very enlightening experience to find out how little we know about cleaning up oil. The thing that we must do is to prevent oil spills. The whole purpose of LOOP -- and this is what the environmental community, the ecology center, the Sierra Club, the Audubon Society, and other groups in Louisiana recognized -- was that this was the best way to prevent what we know can occur.

HOLMES: To get back to the Louisiana coastline erosion, which has resulted in the loss of about 500 square miles since 1940, I didn't intend to say that that was entirely attributable to oil and gas activity. What I mentioned was activity such as the Port Fourchon development plant, which includes extensive dredging, canal works, and so forth. The cumulative impact of projects like this has been to accelerate erosion on the Louisiana coastline, with the subsequent degradation of the wetlands.

In their project proposal for the Coastal Energy Impact Program, the Port Fourchon Port Authority cited the LOOP terminal as the major user of their development, and I wanted to know whether you anticipated that in the impact statement for LOOP or not.

READ: Yes, secondary industrial development was addressed in the impact statement. The facilities that LOOP will install were included in the application for the license and were also included in the impact statement.

NANCY IKEDA, Office of Technology Assessment: Since the panel seems to have concluded that public participation was successful in LOOP, I would like to know a few more of the details, such as whether there was technical information prepared to assist the public when they considered and gave their opinion about the LOOP study. If so, who prepared it?

I would like to know more about the number of hearings, the publicity, and the surveys and polls if those were taken. A public participation committee was mentioned, and I would like to know a little more about that.

PERRIN: By the time I arrived at the Louisiana Offshore Terminal Authority in 1975, it had a very active program of inviting public participation. At that time the Authority had a Board of Commissioners that met four to five times a year. Under the Sunshine Law of the State of Louisiana, the meetings were open to the public. Announcements were placed in the paper and sent to interested parties. We had an environmental/conservationist mailing list of about 200 people to whom we sent notices of meetings, workshops, changes in regulations, and proposed environmental protection plans.

The present environmental protection plan is the third edition. There has been continual public input as it evolved.

Drafts of the environmental monitoring program were sent out to interested people and comments were requested, so that they were able to participate in this.

In addition, we ourselves had a speaking program. P.J. Mills went to Washington several times to talk before the U.S. Congress when they considered the Deepwater Port Act. When I arrived on the scene, the Deepwater Port Act in Congress had been completed and the state act completed and revised. But in my three-and-a-half years, I guess I have made about 100 presentations to Rotary Clubs, Kiwanis Clubs, and other types of organizations within the state, and to a few outside the state.

Mention was made that we had pretty good press relations with the project because everybody was in favor of it. Consequently, we have gotten a lot of exposure outside the state that has brought inquiries from publications like the New York Times and Popular Mechanics, and I think that the publicity on the project has been given widespread dissemination to the public. Many of you may remember that about two years ago an oil ship -- not a tanker -- came down the river in the fog and hit the Luling Ferry. The ferry turned over and 75 people were drowned. Keeping these bigger tankers out of the river by having them remain offshore 18 miles to discharge reduces the traffic on the river. This is another reason for the widespread support of the project.

And as has been mentioned, we have leaned over backward to make ourselves available to any interested group, and I know that LOOP has done the same thing.

JOHNSON: There were two formal hearings held by the federal government, one in each of the adjacent coastal states, and a final hearing in Washington. It is interesting to note that nobody showed up in Washington.

MASSE: We had prepared the draft environmental impact statement and had allowed the time, which I believe was 30 days, for the draft statement to be circulated, and then we held the hearings in New Orleans and Freeport. After the draft impact statement was finalized, there was a hearing in Washington.

READ: We have tried to explain the project whenever anybody would listen to us. We started out in October 1972 when LOOP was formed, and members of my staff are continually giving talks. We make ourselves available to interested groups, technical societies, Kiwanis Clubs, Rotary luncheons -- to anybody that wants to hear about our project. They continually call and ask for an update, and we try to be accessible and tell people what is going on. It apparently has been working.

PERRIN: Let me address a little further the question about technical assistance to public groups.

We have offered it in keeping with our capability and what was available. We have told people about Louisiana State University and the State Department of Wildlife and Fisheries' capabilities. About the only request that we have had for technical data was on the disposal of brine from the leaching of the salt dome caverns into the Gulf of Mexico, about two-and-a-half miles offshore.

OLIVER BROOKS, Maritime Transportation Research Board: I should confess, I am a New Englander. I was struck during the National Academy of Science's study, in which I was involved, by the fact that there are distinct political and cultural differences around the country which seem to have a profound effect on the way public participation is viewed and carried on.

When our report was nearly complete, a Mr. Reed who is Executive Director of the New Orleans Port had some comments to make about the relatively optimistic views expressed on citizen participation. He said, "We simply don't do things that way down in Louisiana." I am heartened by the fact that the LOOP project seems to say otherwise.

I would like to know more about the significance of the lead agency concept, as implicit in the Deepwater Ports Act, in the achievement of the LOOP project. It is pretty clear that its impact was profound in terms of this very complex permitting process. But I am more interested in the psychological effect that it may have had on the accommodations that took place among a variety of disparate interests who were involved in this discussion over a good many years.

Clearly, everybody was conscious of the fact that at some point the clock would start ticking for 356 days in a high-profile way, and that the Secretary of Transportation on December 23, 1976 -- or whatever the date was -- would say, "All right, it is go or no-go."

Did this certainty about lead agencies -- absolutely no equivocation about where governmental responsiblities lay -- in fact have a psychological impact that tended to lubricate the process of accommodation?

JOHNSON: In my opinion, it did. I think there is no doubt, with all due respect to my friends in the antitrust community, that that psychological time frame required most of us to work at a pace to which we were not accustomed.

I think it provided us with a degree of cooperation that made our jobs far easier to accomplish. For example, in the legislation there is a provision that if the FTC and the attorney general don't come through with a report, the Secretary shall proceed as if he has received it. So we were prepared to issue a license to accommodate the time frame with or without that report.

BROOKS: I was perhaps as much interested in the psychological advantages that seemed apparent on the local scene.

STEWART: As to the one-stop lead agency concept, I don't think that made much difference, but there was something that did make a great deal of difference in Lafourche Parish, which is a very Cajun area. The people down there were losing population. They were able to afford an education for their children, who then could not find jobs in the home area and were leaving. The perception was that the jobs being brought in through secondary development from LOOP would enable their children to return home. This maintenance of their way of life, this ability for their families to be united again, was very important in the psychological perceptions of the people in the affected area. Nobody knows whether it is really going to happen or not, but this is the way they perceived it.

READ: I think the single window approach worked almost the way it

was supposed to. When we got the license, we got most of the other permits that we needed to proceed with the project. The Corps of Engineers came through about three months after we got the license with the permits that we would need to construct the project. I think the time frame set up in the law was very important. The agencies that had to issue the permits within this time worked very diligently to do so. I personally was one of the people who thought it was a good idea to have a single window approach.

MASSE: I think there was a one-two punch there, with the timetable and the lead agency to beat on the door and point at the timetable. This helped in a lot of mechanical things like the application. We got it in, we distributed it, comments came back.

PERRIN: The federal license was done with a one window approach, but the state license was done through the regular state procedures. The Superport Authority acted as a coordinating agency. We sent copies of the application to some 21 state agencies and made sure that they reviewed it, that they got their comments back on time, and so forth. But in the state, as Dr. St. Amant mentioned, they have been doing pipelines for years. So all of the different state agencies wanted to continue to hold on to their own area. The application was reviewed, the license was issued on time, but I think the one window approach would be more effective from the state's standpoint.

VAN LOPIK: One thing that may be of interest is the studies that were done in connection with the coastal zone management program in Louisiana, to gauge the awareness of citizens in the coastal parishes and understand their perception of the marine environment.

You would think that in Louisiana the marine heritage would just be something you would take for granted. Well, apparently they not only take being in the coastal zone for granted, but they don't even think about it. There seems to be a greater appreciation for oil and gas operations and having grown up with them than for the marine and coastal environment per se.

I think coastal zone management in Louisiana has been helped by the fact that Deepwater Ports Act of 1974 indicates that there has to be a coastal zone management program, or progress toward development of such a program. And of course the coastal energy impact funds are very important to Louisiana, too.

BROOKS: Up north, we call the Coastal Energy Impact Program the Louisiana Repurchase Act.

I have a question on technology. There was an article in the Wall Street Journal about two weeks ago on the editorial page describing the federal government's emergency oil storage program, with an eventual target of a billion gallons and a total price tag within the DOE budget of $25 billion. The impression was conveyed by the Journal that this was perhaps one of the outstanding boondoggles in which the federal

government has participated within the last ten years.

I am struck by the fact that this oil was to be stored in salt domes and that one of the problems appeared to be the federal government's difficulty in solving the problems of this kind of storage. Yet here we are at LOOP with apparent assurances that the owning consortium has the technology fully under control and is quite confident about it. I would be interested in any comments which might clarify that.

STEWART: I am an antagonist to the Strategic Petroleum Reserve of the Department of Energy. As of last Friday, two of the groups in which I serve on the board finished developing the monitoring plan for Bryan Mound site. One of the things we are concerned about is the disposal of brine, and the other is the integrity of the caverns. This issue did not surface with LOOP until the groups in Texas began questioning Bryan Mound. And we agree with John Dingle's congressional committee that this is a boondoggle. The amount of oil stored in Bryan Mound, which is one-fifth of the total capacity to keep this nation going for two weeks, would keep the local chemical company that is located within a mile of that salt dome open for four days, and the cost of this project is absolutely fantastic. The environmental consequences are unknown. The only good thing coming out of it is some research, and to get a handle on that research we have been fighting since July of 1977. It has taken us that long to deal with the Department of Energy.

So it is not always industry that is a problem with the environment. Sometimes it is those people who are supposed to be helping us, the federal agencies. The Strategic Petroleum Reserve is a boondoggle, and apparently LOOP has done a much better job because of contractors. At Bryan Mound, the federal government has to take the lowest bidder, and they have people working there who know very little about drilling injection wells. Yet five companies in Houston who are considered the most expert in that particular field couldn't get hold of the contract because they were not low bidder. This is a problem.

When private industry was doing it they could go after the best available people. I don't know that their solution is going to be any better; you will have to ask them about that. But I do know that the problem with the Strategic Petroleum Reserve system is poor contracting.

MASSE: In approving the LOOP design both from the state and the federal point of view, we have seen engineering studies that show the stability of the dome and that prove to our satisfaction that the actual leaching is feasible and sound.

READ: We investigated the feasibility of storing oil underground in salt domes for a long time, mostly the economics. Industry has been storing petroleum products underground in salt domes for 30 years. There are probably over 100 wells in which they store LPG, ethylene, propane, and butane in this way, without any major problems. It is just that storing crude oil has never been economically feasible until now, when we want to store very large reserves underground or need to store

quantities that come off of a supertanker. A 500,000 tonner carries 3.5 million barrels. You are going to unload it in a day and a half, and you have to have at least that much storage to go into. That was the reason for the economic feasibility as far as the LOOP project is concerned.

Technically, there isn't any problem with storing crude oil or any liquefied gas product underground in salt domes. They have been doing it in Europe and the United States for many years.

VAN LOPIK: That is interesting, because one of the early looks at LOOP from an environmental standpoint resulted in the recommendation that they look at storing the oil in salt domes. The decision at that time was that they couldn't do it; it was uneconomic. So it went to a tank storage facility that would be located within two miles of the shoreline.

I am convinced that from an environmental standpoint it is much better, in the case of LOOP anyhow, to go the salt dome storage route than to build tanks within two miles of the shoreline -- on foundations that are not too stable and are subject to hurricane situations.

PERRIN: From the state's standpoint, we got interested in the Strategic Reserve Program in the beginning and followed it fairly closely. The state was strongly supportive in the beginning, and then the Federal Energy Department started taking steps which somewhat alienated the state. They treated Louisiana and its citizens like stepchildren and just marched in and took over.

So I got involved in it to some extent. It is my understanding from talking with several of the people in the SRP that one of the prerequisites for being hired was that they have no major oil company experience. Consequently, they were taking a group of people from all over and putting them in charge of the program and coordination. They had no real practical experience in what they were doing, and they were rushing ahead under a program deadline that gave them very little time to go back and look at it in retrospect to see what they were doing right or wrong.

The state had a hearing on the Hackberry salt dome situation two weeks ago. Bill Parker of the SRP was there, and he did make the statement that General DeLuca had told them to take a look at having private industry do parts of the SRP program, not to turn the whole program over to industry, but to turn over more and more of it to them.

MASSE: I think the other point about the underground storage is the reduction in the air emissions problems. That is one thing that hasn't been mentioned.

GEORGE TRESSEL, National Science Foundation: I wonder if I could ask you instead to talk again about the public information activities. I am not sure how thorough I felt the earlier discussion on that was. Almost every agency provides speakers when they are asked for. I don't think

you would find an agency that doesn't think it is open and above-board and candid and provides information when people want it, and so on. But they don't usually have such nice, benign audiences. And I wonder if an alternative explanation for the success of the LOOP discussions and the peaceful, quiet decision might not be that there wasn't an informed, well-armed opposition giving you a hard time. Let me pose that as a speculation. I am questioning whether you did anything special in the way of public information, or whether you did the usual thing of just being available.

READ: During the legislative effort on deepwater ports, we had the support of the environmental community on the strength of its being a better way to import oil into the United States than the way it was then being imported. The big question at that time -- it was during the Project Independence days, and the public statements by the government were that we weren't going to import any oil by 1980 -- was: Why are you spending all this money to build a port that won't be done until 1978, if we aren't going to import oil by 1980? I don't know whether we answered that or not, but we just kept plodding along. Our views were that we were going to be importing oil, probably more oil than we were importing at that time. But the environmental community was not against the project, which was an environmentally preferable way to import crude oil.

TRESSEL: Did you do anything special to bring that about? Did you contact them, or could it be interpreted as simply a benign situation where they felt comfortable with it and where the urgency of the situation persuaded them not to give you a hard time?

READ: I believe the environmental community was asked to participate in the hearings before congressional committees, and they did participate actively in the writing of the legislation. Their concerns were building the environmental safeguards into the law, so that we were required to meet NEPA. We were required to have an oil spill cleanup fund that would take care of oil spills and of paying damages due to oil spills. We are required to put 2 cents a barrel into a fund until it builds up to $100 million. We have liability without fault up to $50 million for paying damages and cleanup costs. So these concerns were met in the federal legislation, and apparently the environmental community was satisfied with this.

PERRIN: The Offshore Terminal Authority was responsible for issuing the state license, so we felt that the community of Louisiana should know what was going on. As I mentioned earlier, we had a mailing list of some 200 people who were interested in environmental issues. We mailed out status reports about every two or three months during the most active period. We had a second list that included all of the state legislators. They got copies of the status report. Then there was a third list of the key television and newspaper people throughout the

State of Louisiana, and they also got copies. Consequently, they were informed as to what was taking place at the time, and they were invited to participate or to respond in some way. So that was the public information program, to let interested citizens know what the Authority and its Board of Commissioners was doing and to invite them to respond or participate. Does that answer your question about public information?

TRESSEL: That answers it, but it doesn't settle my concern. It sounds as though what you were saying was: Who are the local opponents? We will ask them, "Do you fellows feel as though this is okay?" All right, that takes care of the people who might fight over this. We will also let the legislators know about it because we want their support, and we will send out press releases. All these things are pretty standard operations.

What about the public? Where are they in this? Do you think that the press releases satisfied them?

PERRIN: These were status reports, reports on what had just taken place, what was taking place, and what would take place, and they invited participation.

STEWART: The environmental community was interfacing with the top level of decision-making. They had total access. If an environmentalist in Baton Rouge wanted to pick up the phone and talk with Bill Read or Shep Perrin or whomever, they could get the answer to their question right then. The level of interface is very important. They weren't dealing with the public relations people who were handing out press releases; they were dealing with decision-makers effecting policy.

TRESSEL: The question that is still on my mind is whether or not the success of this particular project and the peaceful environment has more to do with the openness that you talked about before or with the fact that the situation itself was comparatively benign, that there wasn't opposition there to satisfy.

VINCENT: I think the political situation, the nature of the constituency that LOOP had to deal with, had a profound effect on the lack of opposition. Had a similar project, under similar conditions, been proposed in New England, I think things would have been much different. The fact that people in Louisiana were not only used to but dependent upon oil-and-gas-related activity made a big difference in the way they perceived the whole project in the beginning.

In retrospect, trying to compare what LOOP and the Superport Authority did with things like, say, EPA's new proposed regulations on public involvement in water quality activities, I would say that what happened in the LOOP process, viewed from a national perspective in today's terms, would be considered decent -- nothing spectacular, but

decent.

In Louisiana at that time it was absolutely unheard of for agencies to behave the way they did, and that is one of the reasons they got such a good response. Nobody had made those kinds of overtures to the public in the past, and that had a profound impact.

There are a couple of things that were different then and that still don't happen in cases like this that I think were critical. One of them was the level of the interface between the public and the agencies involved that has been mentioned. The other was the fact that I can't recall any time during the whole period of development of the superport that we were ever surprised by anything either the state or LOOP decided to do. Whenever there was a major change of any kind coming up, we were always notified ahead, either by a telephone call or, in some cases, by actual meetings. We were called a day or two before the announcement was made to sit down and talk to people about what was planned. So we were never put in the position of having to guess at what the implications were.

That is different from having been involved in the process of coming to the decision in the first place. As a rule, we weren't involved at that very early stage, but at least we were never confronted with calls from the newspapers saying, "Hey, LOOP has just announced that it is going to switch from tank storage to salt dome storage. What do you think about it?" That is an important difference between what happens now in many cases and what they did in this case.

BRITTIN: At the coffee break, I was surprised to find out how many people were from New England. Earlier today, if I inferred that I thought LOOP involved peaceful and relatively easy negotiations, I certainly didn't mean that at all. Mrs. Stewart, I know that you are not an easy customer, and I am sure that is true of perhaps everybody up on the platform.

I suspect what distinguishes this particular operation from, for example, the New England one or a lot of other places is that the general public was really very well represented. By that I mean that there was a kind of credibility -- and please don't start wearing halos -- to the spokesmen for the various groups. When you have that, then you don't have to have a very noisy operation. You can argue like crazy, but it is done in such a way that the emotional impact is quite different.

I would also suspect that because of credibility it might well be that various interest groups will not pursue through the courts things that they lost out on in the negotiations, which I think happens frequently in other areas of interest in the U.S. today. This case doesn't appear to have that characteristic, so again, my congratulations.

WILLIAM AHERN, Energy Coordinator, California Coastal Commission: I am still in a bit of culture shock. I feel like I have come to the Big Rock Candy Mountain.

To begin with, you had a tailored act of Congress, which it sounds like a number of you were even involved in writing, with the high level involvement of the Secretary of Transportation and with special staff who paid attention to a number of issues. It sounds like it will be eight years until the time the project gets going from when it was cooked up.

I am not sure whether the same thing happened at the state level, and whether this Offshore Port Authority was a special operation or an ongoing operation. I would be very interested in that, too, because a mailing list of 200 -- we mail out regularly to 8,000 in the California Coastal Commission -- sounds like easy living.

First, could you have done it if the Deepwater Port Act simply enabled LOOP to be built and had said you had to get through the permit process like everybody else, without that special attention? And second, could you do it if you were starting today, with the additional rules and regulations in force? Did this go through a New Source review by EPA? Did it have to get trade-offs like the SOHIO project? Did the Corps of Engineers have the 404 guidelines all the way along, with bioassays of all the sediments?

MASSE: Seadock is now coming again, but we are still using this special tool. Of course, the Coast Guard is now mobilized. I am on a special staff that was put together to do this. But that is a very good question, and I think we will all take a shot at it.

READ: When we first decided we wanted to build a deepwater port, one of the first things we did, right after October 1972, was to make a tour of the federal agencies to find out what kinds of permits we needed. They all kind of scratched their heads and said, "Yes, you are going to need a permit from the Corps, from EPA, the FCC, the FAA, and the Coast Guard. You are going to need a lot of these permits. But there really isn't any mechanism for permitting outside of the continental limits of the United States." They suggested that we needed some international agreements to do that and that this was something that might better be handled through the Law of the Sea Conference. We could see a very long lead time to get something through the Law of the Sea Conference on deepwater ports.

Actually, one of the people in the Interior Department, a deputy undersecretary, said, "Why don't you just go out and build it, and see who tries to stop you?" We thought better of that.

But while we were talking about building this, there was a committee set up under the President to look at the licensing or legal aspects of permitting deepwater ports. This led to congressional hearings and recommendations and to each of the agencies in the federal government trying to decide whether they ought to be the lead agency, or whether there ought to be a lead agency. It was a very complicated process in the initial stages.

To boil it all down, we felt that we ought to have authority from someone to build a deepwater port, and that that authority would have to

be from Congress. It could have been done by presidential initiative, but they decided to do it through congressional action.

MASSE: This is one that bubbled up to the top, and a law was passed. If you put that kind of muscle on it, something eventually gets built. The other things that were put on top of it, the one window and the timetable, are the kinds of things where people take the bull by the horns and distort the existing system to make things happen. Is that the kind of thing you are talking about?

AHERN: Right. And the question is: Could it have been done without that?

JOHNSON: In my opinion, it could not. If you begin to look at the time frame, for example, from the day on which an application is received, the Secretary was required to determine in 21 days as to whether or not the application was complete. Those very rigid time frames that necessitated a processing scheme were the result of requiring a decision in 356 days. I think clearly it could not have been done without these things.

STEWART: I would like to answer the second part of your question about whether it could still be done today. Seadock -- or the Texas Deepwater Port Authority, whichever you want to call it -- is continuing on. We have applied for an amended license under today's conditions, not the 1976 conditions under which Seadock applied for their license. We are having to come into compliance with all the new air regulations, and there has even been some discussion with EPA about applying the Hondo Platform decision to a platform 26 miles out in the Gulf. So we are proceeding in the light of all the current things.

AHERN: How do you think that is going to do?

STEWART: I don't think it is going to hold water, but we will just have to wait and see. Whatever EPA decides, we will do.

ST. AMANT: I think the unit would have been built without federal participation if they had decided not to do it that way. We built pipelines before LOOP, and we have built them since then without this particular bit of legislation. I don't think you should confuse the state legislation and the federal legislation.

If any federal agency had assumed that this offshore structure was just like any other platform, it would have been simply a matter of getting a Corps permit for the pipeline and the offshore platform, and it would have been built. The problem would have started when they hit the shoreline, which is a state problem, and this is the area that the environmentalists and all of us got involved in, trying to get a state legislative procedure whereby we could monitor the system.

From a practical standpoint, unless you make the assumption that one

of these big tankers might have an accident out there, this structure is no different than the other 2,700 platforms that we have built on the coast of Louisiana and are continuing to build. These pipelines are no larger than the perhaps 1,000 miles of pipeline that now exist out there. The thing that happened here was that the federal government took some responsibility beyond its legal jurisdiction, so to speak, of three miles. They wanted to get some kind of handle on it. Otherwise, there was no way to go about it.

MASSE: What do you think the Department of Justice or the Federal Trade Commission role would have been if the law was a one-liner that said go and do it?

JOHNSON: I think it is important to note that the legislation is pretty clean. You don't find many compromises. You don't find various interest groups who struck a deal, except the oil industry. And the one area of the legislation in which the petroleum industry did not have great control was in fact the area where problems arose, and that is in the antitrust subcommittees. Here is a nice piece of legislation with no great differences of opinion with respect to the various interests on the Hill.

David Brown, will you talk to us about the antitrust groundwork?

DAVID BROWN, Attorney, Energy Section, Antitrust Division, Department of Justice: I have been with the Department of Justice since the fall of 1975, two or three months before LOOP filed their application.

Late in 1975, my boss called me into his office and asked me if I knew anything about deepwater ports. I said no. He said, "Well, you are the perfect candidate for the job." I took over, basically, the responsibility for starting the Department's antitrust review.

Both of the antitrust agencies, Justice and the FTC, are obliged by statute to provide the Secretary of Transportation with antitrust advice in the form of a report for every deepwater port application that is filed. The statute also makes clear that there is no waiver of our traditional remedies under the regular antitrust statutes to challenge any anti-competitive activity growing out of the construction, ownership, or operation of a deepwater port.

The idea of the antitrust review is to provide prophylactic rules and advice to prevent situations where the federal government is substantially involved in the creation and licensing of a new facility, to try to get important matters of competition policy straight beforehand and before substantial capital investments are made.

Without this kind of framework within which we could provide advice to the one window agency, it would not have been possible for the Antitrust Division, except on the request of LOOP or Seadock, to structure in any way the ownership or operation of the deepwater port facilities. We would have been obliged to look at them after the fact and decide whether there was any violation of the antitrust laws associated with the way the port was going to be owned or operated,

after all the investments had been made.

It was the congressional determination to inject us into the process in a formal advisory role that made our participation possible. While we still can sit back and rest upon our ability to later sue, the Antitrust Division has a long history of keeping its bargains with industry in terms of its participation or advice beforehand, of sticking with the recommendations and advice that it makes and not suing industry at a later time.

I believe that the process has built up a certain amount of mutual trust between the antitrust agencies and those who are going to be building and operating the port that would not be there without this antitrust review and the one window approach.

ALEX MORIN, National Science Foundation: I was struck by something that Ms. Stewart said a few minutes ago. She said, "we," speaking presumably both for the environmental groups she represents and as an advocate of the development in Texas of the offshore facility. She said, "We will do whatever EPA tells us to do." And if you take the Georges Bank situation, the posture of the environmental groups there is, first, don't do anything to the coastline, and second, we will look at whatever EPA does and if we don't like it, we will take them to court tomorrow. It is a very different view of the appropriate relationship between the public interest group and the issue at hand.

STEWART: I used "we" to mean that the Texas Deepwater Port Authority "will do whatever EPA tells us to do." That was not my response as an environmentalist and advocate of offshore ports vs. onshore ports.

MORIN: My question really has to do with the role that scientific and technical information played in the LOOP situation. There is a wide divergence of experience as to whether there is such a thing as objective, scientific, and technical data on controversial environmental issues, and on the need for it and what role it can play in helping to resolve debates over controversial issues. My question of the group here is: What role did it play in LOOP? Was there substantial debate at any point of the need for certain kinds of information, or the validity of information that was provided and presented? Was there critical attack on presentations of data by, say, the oil company group, the state, or the Center, or was there general acceptance that the data that was being provided was, on the whole, accurate and useful?

READ: The environmental data was gathered by the Center for Wetland Resources, which is the state-sponsored environmental agency, along with input from other state agencies. The economic impact was addressed in a Kaiser study prepared and sponsored both by LOOP and by the state Deepdraft Harbor and Terminal Authority. It was an attempt to get objective information, gathered by people that hopefully were beyond criticism.

MORIN: Were they?

READ: I think so. I think both groups had credibility.

PERRIN: If there was a problem, the problem was that there was too much information. The application that came to the state -- and exactly the same application went to the federal government, with a different first part -- totalled some 25 volumes and was about 25 inches high. So if anyone wants any data on the proposed offshore port, all they have to do is come to any one of ten locations in Louisiana where we have copies of the application made to the state. The data are fairly complete with respect to environmental baseline data, environmental impact studies, economic studies, what LOOP plans to do in the way of general design and so forth, sufficient for us in the state to issue a license and for the Secretary of Transportation to issue a federal license.

MASSE: It is my impression that most of the information in the application was used by the people who wrote the environmental impact statement for the Coast Guard, and accepted after study.

VINCENT: I think if the LOOP proposal were made today and the whole process were to begin now, there would probably be a good deal more debate over -- if not the data itself -- the conclusions drawn on the basis of the data, than there was in the initial process. In the past the public interest community in Louisiana has not had the broad access to independent scientific and technical advice that it is beginning to get now. To some extent, the access we have now is due to the LOOP project, because it involves people in the universities who weren't there until the expansion generated by the LOOP project began to show up in the capabilities of the universities to deal with wetlands questions.

The only time that we in the Ecology Center of Louisiana were able to get an "expert" to examine seriously some of the materials that were produced was when a Ph.D. resource economist reviewed the first Kaiser economic study for us and concluded, in a nutshell, that the economic benefits described for the project had been seriously overestimated. His report was published and received some distribution and publicity. But by and large, the public interest community, with that single exception, really didn't have access to technical expertise and personnel independent of state agencies.

I think it is safe to say that the state agencies were perceived to be at least leaning toward advocacy for the project. I don't think they were perceived as totally objective and impartial in this whole process. Those of us who were involved in this were put in a position of sitting down with Bill Read and Shep Perrin and P.J. Mills and some of the others, listening to what they had to say, and trying to decide in the absence of a lot of solid technical knowledge whether or not what they had to say made sense. More often than not, it did. And in retrospect, I think we probably would have come to the same conclusion, even if we had had some of that technical expertise. But it wasn't there, and I

suspect that there would be more debate about technical and scientific considerations if the proposal were made today.

MASSE: In the early seventies there was a lot of thrashing around about a number of different deepwater ports. We are talking about the survivor. One of the things about the law is the virtual veto power of the states. I think that is central. We have Son of Seadock, and we have LOOP.

AHERN: I heard the Hondo Platform mentioned earlier, which has been our classic platform in the Santa Barbara Channel for about five years. We in California have something of a fear in our regional and local agencies. We see these decisions being pushed up to higher and higher levels of government, until there will be the ultimate one-stop shop someday, perhaps in the Department of Energy. I would say that this exemplifies the trend very clearly.

PERRIN: Congressman John Breaux, the author of the Deepwater Port Bill in the House, told me when I arrived late on the scene -- not having gone through the process that P.J. Mills and Dr. St. Amant and others had -- that he had wanted to introduce a bill on his own just to permit Louisiana to have a superport outside the continental limits. The people in Texas said no, they wanted one, and the people at Ameriport, which was at the junction of Alabama and Mississippi, said no, they wanted one, and somebody around the Delaware area said they might want to have one someday. So it became a cooperative law that got a lot of people involved, whereas really all Louisiana wanted in the beginning was to be able to go beyond the three-mile limit.

John Breaux said we made a big mistake by getting everybody into the act.

SUZANNE POGELL, Smithsonian Institution: I am on EPA's workgroup on public participation. The institutional and technical evolution of LOOP is fascinating. I am just wondering if the problem that some of us are experiencing is that this was not a conflict resolution by equal, vociferous input by various groups. Maybe it just isn't a case study in public participation.

MASSE: In a forum discussing seaward development, this is one facet of one big project, and we might ask why. I think it bears on the issue.

PERRIN: I didn't understand that this was to be a public participation conflict resolution discussion.

POGELL: I came to the Louisiana discussion because I expected a rather heightened interest in the environment of the State of Louisiana. And resolution of an issue by various parties involved I would think would be one of the criteria for calling it a citizen participation case

study.

STEWART: It is a case study. It is far from the usual case study, and it should be looked at in that light. What has happened since public participation has become institutionalized is that public groups have a lag -- and this is particularly true in the South and in the Gulf Coast areas -- in developing the technical expertise to deal with the institutionalized arrangement of public participation, because it is becoming daily more sophisticated as the rules and regulations are developed by the agencies for public participation.

For example, in the State of Texas, in trying to deal with an air board hearing on a new construction permit, it is like going to court. It is not like an initial public hearing. You have to be represented by legal counsel, it is very expensive, public participation is getting tighter, it is requiring more sophistication, and the people who could easily identify the problems in the sixties are now up against a wall saying, "I don't understand what is going on."

Some people are going out and developing the expertise on their own -- we are developing experts in our colleges -- but mostly they go to work for industry or for universities, because public interest groups for sure can't hire them. They may join public interest groups and provide expertise in that manner. But the biggest problem with public participation today is the lack of the capability of the technical expertise. I think this is what we must learn from the LOOP case study. They didn't have it. They were fortunate in the way things worked out, but it was totally lacking.

VAN LOPIK: With any special interest group, a little bit of knowledge is sometimes a dangerous thing. I think one of the problems is how to bring the various special interest groups' technical competency up to a level that gives them a breadth of understanding of what is going on. I know that Lyle goes through this kind of thing every year in opening the shrimp season. He has a public hearing, all the fishermen show up, he presents the data, and they make recommendations as to what to do. But I don't know, Lyle, how you would feel about it if everybody in that room really understood all the inputs into the decision-making. What is the level of competency that is really necessary here? Is there a segmented way to do it? Maybe it is just by putting all the special interest points forward and pulling it together.

ST. AMANT: This is far afield from where we started, but the shrimp season opening is an interesting exercise in public participation. If anyone wants to come down in April I will be glad to have them. To get back to some of these questions, it just happened over time that this thing came out like this, to be perfectly honest about it.

If the oil companies had come to me in 1969 and said they wanted to put in three 50-inch pipelines across the coast of Louisiana, and if they didn't have to get an offshore permit for some curious reason,

those pipelines would have gone in within six months or a year, as fast as they could put them in. They would have gotten the attention that I could give them, which would have been about certain restrictions on how to lay the pipes, but there would have been no way to block it. As a matter of fact, there is still no legislation in Louisiana that gives me the arbitrary power to stop any of these functions. And I don't think there are any in the federal government. This is one of the problems with the administrators. Nobody wants to stand up and set the priorities, which are whether or not you want to protect renewable against non-renewable resources. And you get into money problems here.

If somebody told me to protect the fish in preference to oil and pipelines, it would be a lot simpler for me to say no, because then I never make a mistake. It is only when I agree to something that I am sticking my neck out on these things.

When LOOP came in and asked about this thing, I said, "You can get the pipeline permit out of me, but you want to get it right with the rising environmental interests in the state." We had a number of permits up for consideration where the environmental interests for the first time were being heard, and they were willing to go to court. So as an advisor I told LOOP, I don't think you are going to get this thing through in the public light unless you get some legislation and proceed differently.

Luckily, though maybe it took a long time, they took this advice. They went back to the environmental interests, and when this bill came up, everybody was happy. But there was some head knocking to see who was going to get some muscle into this system.

For the first time in Louisiana, the environmentalists have got muscle. They can stop this project if it really damages the environment, or slow it down and make it change. If you could get this environmental muscle into all of your permitting systems, you might not have so much noise from the environmental groups.

If you have 15 environmental interests that all want something different, though, you are not going to satisfy anybody. But this was a time in history that just made it work out right. Now that the environmentalists are better informed, now that they are more interested in Lousiana, now that they know what they can do in the way of legislation, maybe the next one that comes up is going to be a little tougher. But don't you ever believe there was no public debate in Louisiana. We may not have had a town meeting situation -- in Louisiana it works kind of behind the closets and under the tables -- but most of the people in the State of Louisiana are pretty well satisfied with it.

CASE IV: A MANGANESE NODULE PROCESSING PLANT

CASE TEAM

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JOHN E. FLIPSE

Visiting Professor of Ocean Engineering
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INTRODUCTION

I'm Jack Flipse. I am now a teacher, a researcher, and a consultant in ocean mining. About a year ago, I was the founder, president, and chairman of Deepsea Ventures, Inc., and I have been in ocean mining activities, in one form or another, for about fourteen years. Prior to that time, I was shipbuilder, merchant seaman, ship designer, and world traveler. My interest in this Forum will become clear as I make a few introductory remarks and set the framework in which the discussion will be held. Our other speakers will then introduce themselves and make clear, if there is any question, their areas of interest.

I will not go into what manganese nodules are, except to say that they're not attractive in the aesthetic sense, that they blend beautifully with their environment, and that unless you turn on the light and keep the sediment cloud down you will never see one in its natural habitat.

The interesting thing is that the nodules contain, variously, about 25 to 30 percent manganese, 8 to 10 percent iron, 1.5 percent nickel, 1.25 percent copper, 0.25 percent cobalt, and appreciably smaller amounts of another 18 to 22 or 23 metals -- all in the oxide form. They are located widely throughout the world, but the important first-generation mineable deposits are included within the major circulatory currents of the Pacific Ocean in low sedimentation areas. The area that has gotten most of the attention so far is between the Clipperton and Clarion fractures in the North Pacific. I know, having been there, that there is a mirror image deposit in the South Pacific. There is no point, however, in going that far from home if you don't have to.

There are three factors I think we should focus on. The first concerns the possible uses of the nodules. Let me point out here that the mining, the testing of equipment, has been progressing very well. We call it dredging. Ultimately, the mining requirements will depend on the purposes for which the nodules are mined. There are three main possibilities. If you sell or plan to market only the manganese, one-third of each nodule will become marketable product, another third is water trapped in the nodule, and the other third is junk -- gangue material, to use a more dignified term.

If you plan to use all four of the predominant metals -- manganese, nickel, copper, and cobalt -- a million-ton-per-year operation is practical. That's a million dry tons, which means you would actually mine a million-and-a-half-tons because of the water content.

Finally, if you are going to focus only on nickel, copper, and

cobalt, you will need probably three million dry tons, or four-and-a-half million tons of wet nodules. A maximum of 5 percent of the dredged material will be taken as metal product. The balance is the gangue material.

We have several people here who will talk in some depth about the processing. I would just like to say that in all likelihood, the early processing will be on land and will require the transport of nodules from the mine site where they're dredged from the seabed to a land processing site. That raises the central question of this case: Where are we going to put this processing plant?

On the other hand, we are involved in several other real issues. First, there is the need for the metals. As you know, manganese, nickel, and cobalt are almost 100 percent imported in the United States, except for reprocessed scrap material. The United States is a very large copper producer, but the last mine that opened for copper in the U.S. had only 0.2 percent copper in the ore. We're looking at 1.25 percent or more of copper in the nodules. Further, the U.S. imports 20 percent of its net copper supply.

The second major issue in which we get involved in ocean mining concerns the new world economic order. The Law of the Sea debate is a marvelous employment opportunity for large numbers of people. The real issue, however, is whether we are going to redistribute the world's wealth or going to continue to control the metal sources essential to our economic welfare.

The third issue is the business of actually winning the metals. Where will we put the plant? In the 15 years that I worked in the business, I was disappointed by the attitudes of the people and governments of the West Coast. The people in the State of Washington didn't really want more people, much less a raw materials industry. Oregon said No. California has an unbelievable permitting problem that led me to consider the West Coast as "closed," a premature judgment, perhaps, but that was my conclusion. The Panama Canal Treaty took care of the Gulf Coast. Can you imagine carrying the "heritage of mankind" through the Panama Canal over a long enough period to amortize the plant?

We are blessed to have Gene Grabbe here, who will introduce himself soon and tell you why Hawaii is a unique situation. There are overseas locations, but these could compromise the alternate domestic source objective.

There is an alternative that one of our panelists may discuss: processing at sea. Technically, it's probably possible with more development. In terms of costs, it now seems unlikely. Yet, I think ocean mining will happen, if for no other reason than that we're going to run out of an economically feasible supply of manganese in about thirty years. And if the Cubans trotting around Gabon decide to make an issue of it, the free world will lose 60 percent of its presently available managanese much sooner. Our last major source, except for the U.S.S.R., is Africa. Do we want to bet on South Africa? The basket mines of Morocco and India are closed as uneconomic.

Remember that the steel industry depends on having 14 pounds of manganese per ton. Our South American neighbors are conserving their manganese; if they're going to make steel, they're going to need it.

Therefore, I'm convinced that there will be ocean mining. If we don't do it, others will. Now let's move on to the rest of the panel.

STEVEN A. FRISHMAN

Publisher, The South Jetty
Port Aransas, Texas

I'm from a small town in Texas, and I live in Port Aransas on Mustang Island, across the bay from Corpus Christi. My background is in marine geology and environmental engineering, which qualifies me superbly for publishing a weekly newspaper. I do that part of the time. I'm a member of the Texas Coastland Marine Council. The council is an agency whose charge is to advise the state legislature on coastal and marine affairs -- everything from fisheries to hazard awareness through port development and so on. I also am on the Texas Coastal Management Advisory Committee. I work as a consultant to the state land commissioner, and my most recent job for him was rewriting the substantive rules for that agency. The agency, among other things, is the keeper of all the state's lands. The wetlands in Texas are largely in public ownership, which gets us into the questions of oil and gas leasing and competition for resources. This leads me into one of the areas where I spend a fair amount of time, the question of public interaction with the process surrounding government policy and regulation relative to development in coastal areas. And when I'm not doing specific consulting jobs in that area, I'm also working with the Texas Environmental Coalition.

J.D. NYHART

Associate Professor
Sloan School of Management and
Department of Ocean Engineering
Massachusetts Institute of Technology

I am a lawyer. Although we have no law school at MIT, we have lawyers concerned with the way new technologies and scientific advancements are implemented in our society. How do you build a new legal regime for ocean technologies? We've seen in the ocean area one of the most rapid fields of expansion and development of technology in the last two decades. Within 10 years after the Geneva conventions -- certainly within 20 years -- the legal regime of the oceans was entirely inadequate. We are in the process not only of trying to build a new global legal regime today, but also a domestic one. On the federal, state, and local levels, we are trying to build legal regimes that can allow ocean technologies to be implemented in harmony with all the conflicting interests.

So the kinds of issues that I'm interested in are: What is the role of government? How much ought the federal government to anticipate what might happen? How much should the government leave to chance and how much to resolution in our courts? Those interests have brought me, in the last three years, to work on deep ocean mining. We have built a computer model at the Institute looking at the costs and economics of deep ocean mining, and I've been directing that project. I've also been involved in the question of how you build a legal regime for a surface technology such as ocean thermal energy conversion, as well as in the concern about a legal framework to ensure the adequacy of thick structures offshore.

My bias is that government should anticipate the kinds of technologies, the needs for information that they as regulators are going to have. They should try to get that information early, to establish at least a basis for it. Some of the issues that we ought to be discussing today move away from the legal regimes, though, to the question of commercialization. Should the government be active in trying to alleviate legal and other barriers, economic barriers and so on, for deep ocean mining? Also, what is the role between the states and the federal government likely to be? What kinds of conflicts are going to come up over land processing?

EUGENE M. GRABBE

Manager
Center for Science Policy and Technology Assessment
Department of Planning and Economic Development
State of Hawaii

I'm a physicist. After some 30 years of industrial experience in research, sales, and management, I had the good fortune in 1971 of being appointed to a new Center for Technology Assessment in the State of Hawaii Department of Planning and Economic Development. In looking for new horizons to assess, we also peered into the depths of the ocean. At that time, there was a great deal of activity that involved the University of Hawaii, local industry, and the state in exploration for deepsea nodules close to Hawaii.

We seized this opportunity to start a state manganese nodule industry program, and over the last eight years we have been involved in conferences, assessment workshops, and information dissemination through public meetings, TV, radio, and a lot of publications. An early result of these efforts was that we obtained some state funding in 1977 for a more preliminary assessment, which was completed early last year. The resulting report, "The Feasibility and Potential Impact of Manganese Nodule Processing in Hawaii," was published about a year ago. During the past two years of this assessment, we have obtained the participation of people from the national level, state and county governments, environmental groups, and the technical community. We've looked at both the pros and cons of having a manganese nodule processing plant in Hawaii.

We have also had the good fortune of discovering geothermal energy, and we have many good sites for ocean thermal energy. So we feel that there are many benefits that Hawaii could gain from this activity.

As a result of our assessment, in September of last year the Ocean Minerals Company -- my colleague Conrad Welling is a member of that group -- announced their intention to build a 4-million-dollar pilot plant on the island of Oahu in Hawaii, far larger than any previous processing plant. It should provide waste materials and tailings of great value for research, as well as knowledge about how plants operate and how to dispose of wastes. So we look forward to working with them.

At present, we're continuing the program; our ongoing state funding has been augmented by NOAA funding. We will produce a second report on our work, expanding it and generalizing it, and we expect also to have some technical workshops and public meetings to obtain further inputs.

In summary, I represent a state that has taken a very active role in assessing the pros and cons of the manganese nodule industry. The result has been a public response favorable to the development of a

manganese nodule industry in Hawaii. Looking to the future, we are very interested in the potential onshore benefits of using the wastes from the manganese nodule processing. In our preliminary report, we assumed the wastes could be returned to the ocean, but it may be more beneficial to the environment to use them on land. Research is needed on this subject.

CONRAD G. WELLING

Vice-President
Ocean Minerals Company

I have been heading up our company's Ocean Mine Development Program for the past 15 years. We are now the Ocean Minerals Company, which is made up of Royal Dutch Shell, Standard Oil Indiana, and Bos Kalis, a Dutch dredging firm. We have leased the Glomar Explorer and are in the process of testing our mining equipment. In conjunction with that, we are starting to scale up our processing development work.

Why mine manganese? There are certain very promising characteristics of the deposit that need examination. In the first place, we feel the metals it represents have strategic importance, not only to the United States but also to the needs of a developing world. By any measurement you can make, the deposit is an outstanding one. We've studied it for years, and the amounts of the metals associated with it are orders of magnitude greater than those of any other deposit in the world, whether we're speaking of nickel, copper, cobalt, or manganese. So we can look forward to centuries of supplies.

Second, because of the vast quantity and the grade, we can look forward as time goes on to this being the richest deposit. Even though there are deposits on land of, say, copper or nickel that are richer, those deposits are being mined at a rate such that the ore grade is decreasing rapidly. And as the ore grade decreases, it requires more and more energy to mine a given deposit. I subscribe to the thesis that there is no such thing as a mineral shortage per se, but there certainly is a shortage of economic grades. The same case can be made for energy. There is no such thing as an energy crisis or shortage; there's a shortage of low-cost energy. And energy is going to keep increasing in cost.

It behooves us to be looking for ways that we can produce the ever-increasing amounts of metals or minerals required at a lower cost, or at least at a money cost not prohibitively higher, and certainly at a

lower energy cost if we can. All our studies indicate, as an example, that we can produce a pound of nickel from a manganese nodule at about half the energy required to produce a pound from land ores.

Therefore, there are a number of compelling reasons why it would be beneficial to develop this resource. We have, as I indicated, spent a considerable amount of money, and we plan on spending a considerable amount more. I testified in Congress last year that our bill to date is in excess of 70 million dollars, and that we are planning to spend at least another 100 million in research and development before we start making a capital investment in the early 1980's. And that, as other people have testified, it will probably require at least a half a billion dollars in total costs -- it could easily be more -- before one dollar comes in. After we get into operation, it will probably take six to seven years before we can get back in dollars what has been spent. This is a long-term, high-risk program. However, we feel that the risk may be worth it in the long run, provided we can operate under a stable legal regime. This is one of the main problems affecting the rate at which the ore can be developed. And I assure you that even though we have a surplus of nickel and copper today, this will be shortlived. The studies made by the Geological Survey and others indicate that if we are going to meet our ultimate energy sources in the year 2000 and beyond, without the development of the manganese nodules we will not have enough nickel, copper, cobalt, and manganese to develop the alternate sources of energy. So it may not be a question of economics any more; it may become a question of trying to provide for future energy needs -- in fact, of survival.

AMOR LANE

Director, Marine Minerals Division
Office of Policy and Planning
National Oceanic and Atmospheric Administration
Department of Commerce

Before coming to the government, I spent most of my career in industry as an engineer in oceanography, not in the mining or the oil industry. I also spent 1970 to 1971 working with the Governor of Delaware as Executive Secretary of his Task Force on Coastal Zone and Marine Affairs.

With respect to the questions we're going to discuss, I would like to mention several relevant points. First, I think most of us realize that

a Deep Seabed Mining Bill will probably be reintroduced this month in Congress. And in discussing what the role of the federal government should be, we should note several of the purposes mentioned in the bill. One of them is to encourage the development of deep-seabed hard mineral resources. A second one is to establish a regulatory framework to ensure that the development is orderly, efficient, protects the environment, and promotes safety of life and property. Another purpose is to accelerate environmental assessment research.

It is of interest that the Council of Environmental Quality published new regulations just a couple of months ago that have to do with the implementation of the National Environmental Protection Act (NEPA), and this is a very sweeping modification, I might add.

Finally, I wish to point out some of the preparations the federal government has been making, with programs that embrace environmental, economic, legal, and technological questions. We've sponsored the DOMES (Deep Ocean Mining Environmental Study) Program at Sea, which is directed toward the environmental impact of the mining itself. We've also sponsored research dealing with the environmental aspect of processing to determine, for example, some of the environmental parameters that will have to be taken into account when environmental impact statements are written. There have been follow-up projects involving meetings with state agencies on the West Coast and the Gulf Coast to elicit from them some of the practical problems of siting the processing plant. The purpose of these projects, however, was not to try to define where the plants should be located. Obviously, that is up to the industry.

Another program we are planning is one that will analyze the various federal and state laws and regulations, including municipal ones where applicable, that would apply to the siting of a processing plant. The initial phase will start with the West Coast states. One goal will be to determine some of the timing requirements: How long would it really take to get the permits?

The hope is that such programs will enable us to prepare adequately for environmental impact statements, to form the basis for future regulations, and to ensure that the tools necessary for making important decisions will be available when license applications are submitted.

FLIPSE: You have now met the panel. By this time someone must be concerned, and if you would please give your name and ask your question, we'll do our best to answer.

GENERAL DISCUSSION

THOMAS A. GRIGALUNAS, Associate Professor of Resource Economics, University of Rhode Island: Some of the earlier studies of the feasibility of manganese nodule mining -- I am thinking specifically of Walter Meade's and Phillip Sorenson's study -- indicated that the economics simply didn't look good. This was in the late 1960's and early 1970's. I know you've developed an economic model, and I'm curious about some of the base case results. What do the economics look like in terms of present value or possible rates of return? What are some of the key assumptions and problems that accompany your results?

NYHART: Well, Tom, I think that also brings in others besides me, because Connie and Jack are here and they have probably two different views of what the economics look like. Before I say anything about our results, there's a qualification I want to make. If you look at the four consortia today, you're going to get at least four different answers as to what the economics look like, because nobody has yet run a deep ocean mining project commercially. There are, as has been indicated, not only political problems, but technological problems and -- in terms of the metals market -- economic problems.

We did a base case study of a three-metal mining project that is not processing manganese but is processing the other three, with a throughput of 3 million tons of ore per year. We looked at the costs of the exploration and prospecting of the mining, of the transportation, and of the processing, taking off-the-shelf technology and analogous technologies. We had those cost estimates reviewed two or three times by members of the industry and then plugged the costs, both capital and operating, into an economic analysis part of our model. I will get out a copy of the study case in a minute if anybody is interested.

We came out with a base case result, over a 25-year period, of an internal rate of return of somewhere around 18 percent. Now somewhere it changes very fast once you begin to talk to industry. For example, Connie mentioned probably 170 million in R&D before any decision could be made to invest. We used a much lower figure for R&D. In talking with the Lockheed people I think we would revise that, at least for situations in which a consortium is developing new technology and is likely to have new and heavy R&D costs, banking on advantages to be realized not in the first project at sea, but in the second, third, or fourth one.

If you take our base model and triple the R&D figures and stretch out the R&D time, you quickly get a different internal rate of return, perhaps half of the 18 percent.

Let me give you another example on the economics. If you move to a four-metal model in which you are also producing manganese, it's likely

that your capital costs go up, lowering your internal rate of return. We had capital costs of around 600 million. Incidentally, our payback period was roughly in the neighborhood of the one that Connie mentioned, six or seven years.

Our assumption, then, is a return of around 15 to 18 percent, although perhaps not for the pioneering project. There is another thing I think we've learned: That the uncertainties of the first project for any consortium are going to result in delays that drive costs up and return down.

WELLING: I'd like to add to that. As I mentioned before, we have an R&D bill anywhere from 150 to 200 million dollars before an investment decision is made. The reason is that we continue to make what we call feasibility studies, as they do in the mineral industry. We feel that to make the system an economic one that investors will put money in -- otherwise you don't have a program -- it does take an intensive research and development program, and that's what we have.

Now, there's nothing yet to show that we can meet the requirements of a system efficient enough to give that kind of return on investment, and I know there's no way that we can do that on the first system. Even if we meet all of our technical goals of efficiency -- and I mean efficiency in the whole system, not only in the exploration phase, but through the mining phase, the transportation phase, the processing, and the proper marketing of the end product -- the first system will at best be marginal as a business investment. So there's no way I can sit here, after spending in excess of 70 million dollars over the past 15 years, and say that we're going to achieve the goal from the first phase of even a 7 percent return, which at today's market is not economic.

I want to make that clear. Second, I want to emphasize that there's not just one way; it is not unreasonable to have each consortium come up with different ways of doing this. We've already heard about whether you go four metals or three metals. Now, there's an economy scale in this operation, and we have to achieve a delicate balance between keeping the initial size of the plant down so the capital investment will not be too high, and still having enough efficiency in the plant that we'll get a return that will attract investors. If you go the manganese route, there's a definite market limitation on plant size; for the system we envision it will be about a million dry metric tons per year.

The non-manganese or three-metals route allows more latitude, and probably requires around 3 million dry metric tons per year. But with greater tonnage, where do you locate the processing plant? As Jack indicated, one-third of the nodule is sea water, and it certainly isn't profitable to ship water around the world. If the processing plant is too far from the mining site, considerable profits will get eaten up in transportation costs. So a very efficient system of transport is needed. If you go the manganese route, you have more leeway simply because of the revenues from the manganese, but again, the capital investment goes up.

So there's no simple answer today. We hope within a year or two that our research and development program will give us enough information so we can say at that point, the feasibility study indicates we should continue.

GRABBE: May I comment briefly on what the impact on a state would be. Connie mentioned 3 million tons -- that's dry weight -- of manganese nodules, which is the figure that NOAA has used in their various studies. We have a good input/output econometric model in Hawaii, and analysis showed that a plant that size would require over 500 million dollars investment. The revenues to the state would be such that the gross state product would be about 335 million dollars. That would make the manganese nodule plant the sixth largest industry in Hawaii. During construction, there would be about 6000 jobs -- this counts indirect as well as direct jobs -- for a three-year period. During plant operation, this would be reduced to about 2400 jobs. So we're interested in the revenues and the jobs that such a plant would provide, but we're also interested in keeping a clean environment in Hawaii.

FLIPSE: Before we take the next questions, let me just add two considerations. First, no one will make an invest/no invest decision without taking his R&D as a sunk cost. This approach appreciably shortens the timespan and therefore gives you a much better chance for a positive return with realistic discount rates.

Second, if you're arguing at the Law of the Sea Conference, there's going to be a very low return. If you are soliciting funds, there's going to be a very high return. Both numbers can be made accurately; it's just a matter of whether the glass is half empty or half full. If you want to go into detail, I would suggest that you buy Dan's book and study it, because he realistically handles all of these concerns.

LARRY SILVERMAN, Clean Water Action Project: I was very impressed with your statement on the need for manganese; the fact that we're going to have a shortage is important to steelmaking and is important to the world in general. I have a hard time reconciling that argument with the statements made by the other panelists that maybe we want to not produce manganese at all, but to take this 25 to 30 percent of the nodule and waste it in some way or other.

FLIPSE: A metal company such as a nickel or a copper company looks at ocean mining in terms of their conventional product line. It has to be a big enough operation to supply their needs to be interesting. It is true that if you produced manganese at a very high rate you would dislocate the present manganese market. I refer you to testimony in the House of Representatives before the Oceanography Subcommittee of the Merchant Marine and Fisheries Committee. U.S. Steel produced and entered in evidence a document which they swore they'd never reveal, an analysis of the locations of world manganese deposits. There hasn't

been a new one discovered in 25 years that's of any significance, and as costs go up, the small deposits become less and less interesting. Which brings us to the conclusion that perhaps a good starting point would be an ocean mining plant that did use the manganese. There is deliberation going on right now in all of the consortia on whether to produce manganese or not.

WELLING: I did not mean the manganese would not be mined and produced. At least one of the companies will go after it in addition to nickel, copper, and cobalt. But the other companies then would not produce manganese because the first company would be supplying the market needs. Beyond that point, we have to make our profit in the nickel, copper, and cobalt in the nodules. It's of strategic importance that manganese be produced, but only at a certain level.

SILVERMAN: Where would that 25 to 30 percent of the discarded nodule go?

WELLING: It would have to go into the tailing ponds or back to sea.

FRISHMAN: It seems to me extremely wasteful to expend energy and discard the manganese when you know within a real time frame -- if we can believe your 30-year figure -- that you're going to need some more of it and that you'll have to expend additional energy at some future time. Of course, this also depends on what it costs to store it on land, whether you can store it in a safe way, and so on. And I fault the present thinkers in even looking at deep-sea disposal as a viable alternative. I think it's extremely shortsighted financial thinking. Aside from that, I fail to see any reason for the apparent optimism about getting permission to go into a deep ocean disposal system.

WELLING: Over a period of 15 years we've conducted a number of extensive studies on all aspects of deep ocean mining. We certainly could not have spent the tremendous amount of money we've spent without having thoroughly researched this. And manganese is being produced in the nodules on the ocean floor -- even if it takes millions of years to produce a nodule -- at a much faster rate than any demands for it that I can foresee in the next century. If at any particular time the need for manganese grows faster than what we need now, it will still be available in larger quantities than we can use as a result of the production of nickel, copper, and cobalt.

IRA DYER, Massachusetts Institute of Technology: I have yet to understand what is unique about manganese nodule processing on land. That is to say, other industries have wastes, other industries use resources like energy and water. What in particular stands in the way of gaining permits for processing -- just what are the issues with respect to the processing itself that make the manganese plant a unique plant?

WELLING: There's nothing about manganese nodule processing to make it unique from other mining processing known today. The methods that we typically use are no different, basically, from those used in a chemical plant. The only things unique about manganese from nodules are that it is new ore, different from other ores, and the location from which we obtain it. But it is an oxide, as many ores are; we use high temperatures and high pressure acid leaching as the most likely approach. Some processors may even use a reduction prior to leaching. The possibility of a limited amount of smelting exists, probably in already established smelting plants that use other ores.

FRISHMAN: There are some things important about manganese processing, but maybe not unique. It represents a new process that exerts additional pressure for use of the coastal zone, in terms of the landing of the ore. This is true whether you decide that the processing plant will actually be in the coastal zone or whether you can economically justify slurrying the material to an inland plant -- it's one more potential alteration in terms of just the physical system of the coastal zone, the air and water quality. The demand feeds back the other way, too. There's an electricity requirement, there's a fresh water requirement.

ALFRED A. H. KEIL: For the United States, I think the situation with a manganese mining plant is different from the other ore processing plants because we don't have ore processing plants along the shore.

FRISHMAN: We do, and they historically have been the worst polluters available.

KEIL: Not where you want to land it, apparently.

NYHART: Connie, did I hear the implication right, that you're considering -- or at least some of the consortia are considering -- existing facilities for processing?

WELLING: I said, certainly, that studies have indicated that in the case of smelting it's the only way it could be economically done. We are not, however, going that route. I'm saying it's a possibility. I've seen studies made by the Japanese and there is a possibility there. I think other people have also studied it. But probably 90 percent or more of the nodules will be processed in new plants -- at least for part of the processing -- that will be like existing, self-contained chemical plants. In other words, there will not be the kind of smoke emission that you have from a smelting operation.

NYHART: Manganese nodule processing may be unique in that it may be typical of a new technology with uncertain economics, thrust into a legal concern for the coastal zone and carrying a vital national interest. It can be asserted that there is a national interest that we

establish deep ocean mining. So you combine three factors here, and it may be a unique combination; I'm not sure.

FRISHMAN: You can add one more factor, too, and that's the high potential that a new plant will be sited in what the oil business calls a frontier area. You're going to be taking a large industrial facility and dropping it on a relatively undeveloped area. Because of rapid oil and gas expansion, this has become a critical question in coastal areas. But I think the same problem is likely to hit the manganese processing plant almost anyplace it's put.

FLIPSE: The driving economics is to put the processing plant next to a petrochemical plant because the across-the-fence exchanges are very important. One waste product is the other man's raw material, and vice versa. This is especially important if you use a hydrochlorination technique or use a chlorine-based acid. All of the PVC monomers need chlorine. The old technique of getting the chlorine back to reuse in the process was to burn off the hydrogen with acetylene. The nodule processing plant needs hydrogen chloride and can easily return chloride back across the fence. For economic reasons, therefore, the chances of a nodule processing plant being placed anywhere but next to a refinery are very low, unless you've got something up your sleeve, and I think Gene feels that Hawaii does.

GRABBE: Well, we take the view that anywhere a nodule processing plant is placed today it will have to meet a set of standards that didn't exist ten years ago. And it may turn out to be a model plant, a plant of the future, in which reagents are recycled, completely enclosed. Our view is that electric power will be needed and probably the power plant will create more air pollution than the nodule processing plant itself.

What Hawaii has to offer, is first of all, our proximity to the rich beds of nodules. If transport is through the Panama Canal, mining companies will use the Panama ship, the biggest ship that will go through the canal. From Hawaii, either ships or barges could be used with no size restraint. Barges might turn out to be cheaper. You just tow one barge out and leave it there to be filled with nodules while towing another loaded barge to Hawaii. We do have the added cost of importing reagents. But if such a plant were built in an industrial park area, there could develop some associated industries. For example, at present we import chlorine into Hawaii, and we could have a chlorine plant which would also generate sodium hydroxide which could be shipped back to the mainland. So there are a number of possibilities. But I think our advantages are good sea transportation, a supply of industrial water, and the potential of geothermal energy, which could be used for both process steam in the plant and to generate electricity. And the spot we picked, for this reason, is 10 miles from the coast and about 15 miles from the geothermal resource. That's a reasonable distance to pump steam, since we have the hottest geothermal well in the world.

Further, in Hawaii we are looking for diversification. We have a high unemployment rate, especially in the outer islands. We don't want to put all our eggs in the tourism basket, and we think this could be a new high-technology industry that would provide jobs for our people, both technicians and professionals.

While one pilot plant is being built, other companies have also indicated an interest in Hawaii as a potential site. We are also attempting -- and the governor has instructed all departments about this -- to streamline our state permitting process so that it will take a minimum amount of time to provide all the safeguards needed for a new industry.

FRISHMAN: You still haven't addressed the thing that Jack mentioned about secondary and spin-off development. Have you told your subjects there's a possibility of this?

GRABBE: Oh yes, we've mentioned it.

FRISHMAN: What do they say? Especially in the area of petrochemicals.

GRABBE: The pilot plant mentioned earlier is being located right next to the Hawaiian Independent Refinery on the island of Oahu, and they will be transferring chemicals, as Jack Flipse noted. If a plant were built on the big island, it would not have that infrastructure initially, but it could form the basis for an industrial park.

WELLING: One of the ways we hope that mining manganese nodules will be beneficial is in holding down what we call infrastructure costs. One of the real problems with land mines is that they must be very large to be economical today, and they must be located, of course, where the ore is, which is in very remote regions. So one finds that the cost of the plant is mostly bound up in the port, the township -- all the infrastructure you need to support it. As a rule of thumb, only 25 percent of the cost is in the mining and processing plant; the rest is in the support facilities, which has driven up the cost of new mines on land at an alarming rate.

So certainly you want to try to locate the plant where you have some supporting infrastructure to hold down the capital cost. This is one of the advantages of ocean mining, if you can hold shipment of the ore to a relatively short distance, and Hawaii and the West Coast of the U.S. represent the closest areas that have any sizeable infrastructure whatsoever to support a mine.

DAVID MOULTON, Staff Attorney, Congress Watch: First, are any of the consortiums now seriously considering ocean-based processing, or do economics rule that out? Second, how do the economics change under the types of legal regimes being discussed at the Law of the Sea Conference, if you have any kind of comparison. And finally, I'm wondering if with

the R&D efforts, the environmental studies being conducted by government, there is any cost-sharing between government and industry.

LANE: As for cost-sharing for R&D efforts, it depends upon how you define it. For example, in assessing the environmental impact of at-sea mining, obviously, you have to have an industry ship at sea to do the test mining while the government is out there monitoring the environmental impact. There were those who thought that industry ought to pay for the research. However, we were able to show that for the prototype tests, in order to ensure credibility the government should pay for its own ships and scientists.

FRISHMAN: Where will that stop, though? That's one of the things that I came across in some of the reports. I get the feeling that the government is going to stay in the business of very expensive monitoring.

LANE: That's a good question, too, and OMB wanted to know the answer. The so-called DOMES program, which is the Deep Ocean Mining Environmental Study, is a time-limited project. And in fact, in its original conception it was to last only five or six years. Now if legislation is enacted, there is a provision which states that the government will monitor the commercial operations to ensure that the environmental safeguards are adhered to. This is necessary to provide data to determine long-term effects and assure compliance with the law.

FLIPSE: How about the comparative economics in the various Law of the Sea regimes, Dan?

NYHART: Let me discuss that under several headings. The first is the whole question of access at all. In the Law of the Sea negotiations, the industry, in North America and in Europe and Japan, is quite concerned that agreements will be made which will place the question of access under an international authority, and that eventually there may not be access to the minerals for private investments or private industry. That is a basic issue in which I think industry has a collective concern.

The second LOS issue -- the question of financial arrangements, as it's called -- is the negotiation of a tax or payments to this international authority, based on one of four different measures. Basicially, this comprises a tax on private industry paid to the international authority, in addition to the national taxing systems under which the companies might be operating.

Now, the financial arrangements basically break down into four different methods of payment that have been discussed at the Law of the Sea Conference. One is a fixed-time charge, and the economics of a front end fixed-time charge are devastating. India proposed at the Law of the Sea Conference a few sessions ago a 60-million-dollar flat fee paid at the front. If you look at our analyses of the economics of

that, that could wipe out an internal rate of return and bring it right down to zero, even within all the ranges that we've been talking about.

A second kind of payment is an annual charge, arranged probably to underwrite the bureaucratic and operating costs of the international authority. A third method of payment to the international authority is a royalty, and the fourth is profit-sharing. Most of the negotiations on financial arrangements in the last year have dealt with some combination of the latter three. I think it's probably fair to say -- although I am not in the position of speaking for industry -- that industry probably favors the profit-sharing and a heavy weighting of the profit-sharing formulas rather than the annual charge. But there has been some discussion recently that at least one of the consortia would favor a royalty-based method of payment, perhaps in addition to profit-sharing.

The economics there differ, and that's one place that the model has been used, I think to the disgust of industry, because you're trying to negotiate a tax rate before you know what the experience is going to be.

WELLING: It would be like the Congress deciding on how to regulate the airlines before the Wright brothers built their first airplane. The industry doesn't exist; everything so far has been supposition. I would say I've had as much experience in this as anyone after spending 15 years of my time on this problem. And I cannot, until I get my mining ship out there and get some experience, say what the industry is like. So to try to set up all these regulations and so forth on a supposition -- many people are making suppositions about the industry who had six months to look at it, or even three months.

NYHART: That certainly has been another much-argued point at the Law of the Sea conferences. On the other hand, if there is a lack of confidence in the future regulator, then there is a tendency to want to pin down the uncertainties. So industry, in a way, is caught in between. They'd like as much certainty as possible, I think, before they commit themselves to any kind of an international regime. On the other hand, when you don't know what the outcome is going to be, it's hard to make a commitment to numbers, particularly when those numbers involve another factor: the concept of splitting the profit three ways. Industry is used to sharing with governments and paying taxes; paying international taxes is another thing.

There are two other items I want to get out on the table. One is the whole issue of technology transfer, and the other is production control. Both of them have definite bearing on economics at the LOS level.

FLIPSE: I think the one point that Dan didn't make is that no one is offering to profit-and-loss share. That's a one-way street. It's totally unrealistic to expect an entrepreneur to have a return on a high-risk investment that's not even the prime rate today. Anyhow, that's the nature of the LOS negotations.

WELLING: It is the nature of mining that operators try to concentrate the ore at the mine site, whether it's nickel, copper, or whatever. With the grades as low as they are, it is not economic to transport all that rock over land, and the same is true for carrying great tonnages of water around the ocean. So there is a strong bent to concentrate and enrich the ore, say, from a fraction of one percent up to maybe 10 or 20 percent. This is certainly a thrust in our research and development.

Eventually, I am convinced it will be done. The question is whether it will be done the first, second, or third generation. But the economics indicate that even the energy required to transport seawater over the ocean should be saved if it possibly can be. So there's an energy equation as well as an economic one. Our research and development tells us that in the future this should be solvable.

GRABBE: John Craven is a proponent of floating platforms, and I think in the long run a real possibility is use of ocean thermal energy power for an ocean-based plant. The metals industry is energy intensive, and the three-metal plant we talked about would take 25 to 50 megawatts of electric power plus process steam and some other energy inputs. The sea-based plant would thus require a large energy supply on-site. If we can generate the power at sea by ocean thermal energy conversion (OTEC), then this would provide impetus to ocean processing. As Connie Welling pointed out, this may be the second or third generation plant. Hawaii is working with Lockheed on a pilot ocean-based mini-OTEC plant.

FLIPSE: We had an inquiry from a Japanese firm that we used to work with commercially, and they're very strong on this. They've spent quite a bit of money on the OTEC/nodule processing combined plant, and when asked my opinion, I said that each of these technologies was difficult enough by itself. If you marry the two of them, you're creating a government project -- which in fact they are in Japan, where they think that R&D should be funded by the government. But as a technically attractive package, the combination is superb. There seems to be agreement that there will be at-sea processing; the big question is when.

WELLING: That is right, because the driving force is too high not to go that direction. But it's a question of when the technology problems are solved.

FLIPSE: Now we need to get back to the subject. How does the public get involved? Where are we going to put the plant? Why haven't we faced the opportunity of marine industrial parks on the waterfront? After all, look at Rotterdam's Europort. Is the United States that far behind or ahead? One real question that needs to be discussed is the amount and nature of the gangue material. Can you put it in your suitcase? Would it cover Washington, D.C.?

GRABBE: Well, the waste output of a 3-million-ton-per-year, three-metal plant would cover, when compacted, about one square mile -- 610 acres -- three feet deep. Depending on the fill, such an area might handle wastes for three or four years. That's the amount of material. We have not seen samples of the wastes.

FLIPSE: No, no one knows what it looks like. All I think the industry is willing to say is that it won't be soluble, it will compact, it won't be an ooze for 40 years or something. It will be fill-grade material.

Yesterday I asked our panel to give me the question that they felt was the most important single issue. And every one of them came up with the same question: What would it take to put a nodule processing plant in your area, not in the other person's area, but in yours? What are the real concerns now, regarding both the environmental and the social impacts?

GRABBE: In Hawaii, we like to have our citizens informed and we take special care to inform the public agencies which are concerned, such as the County Departments of Planning and Economic Development, the State Health Department, etc. We involve them in the process of developing our assessment. They are interested because they have provided inputs and reviewed the report before publication.

These government agencies have frequent contact with citizens who ask about new developments and their impacts. They are able to respond about manganese nodule processing because they understand the process, the outputs, and the environmental and other impacts.

FRISHMAN: There are some problems inherent in the whole question of siting. In Hawaii you've probably taken the success-oriented path, and success apparently in your eyes is to site the plant there.

LANE: I'd like to take a different tack on this. The Hawaii studies involve a state which is actively trying to attract the industry to its shores. Now, from the federal government point of view, we think in different terms -- if you want to prepare for a new legal regime, what can you do to get ahead of the "power curve?" One thing that you can do is start thinking about the environmental impact statement that would have to be written, whether for Law of the Sea, if that should ever get through, or legislation.

One aspect of the environmental impact statement is the on-shore socioeconomic and environmental impact, which encompasses the processing plant. Now, as I've mentioned, the first step was to figure out what is in a processing plant and which of the many processing technologies will probably go commercial. Unlike the at-sea mining aspect, processing techniques have received very little attention in the literature. Of course, there are many processing patents one could study, but it would be hard for the uninformed public to predict which ones would probably go commercial.

Now, you cannot write a very good environmental impact statement if you have information only on the processing technology per se. You must also know something about the location involved. So the next thing the federal government did was to sponsor workshops on the West Coast and the Gulf Coast (since we were told back in those days that they seemed like the most interesting areas from industry's point of view). This, of course, predates the Panama Canal Treaty ratification and a lot of other things. What we did was to meet in an open forum with members of the various state agencies. In hosting the West Coast workshop, we met with representatives from Alaska, Oregon, Washington, and California. In fact, Hawaii representatives sat in on that, too. These representatives came form a wide diversity of agencies. For example, not only did we have the economic development groups, but also those from the air, water, and solid waste disposal agencies, plus the Coastal Zone Management groups. In addition, electric utilities and railroad representatives were involved.

This was a fascinating experience, because we realized that we were facing the people who lived in the areas where a processing plant could be a reality. We anticipated numerous protests.

One of the surprises was that the representatives were impressed that we had come to them years in advance of when such a plant would become a reality. This seemed to be something new for them, and I believe it encouraged the state participants to be open. I won't say that they were more receptive, but at least they were pleasant as they pointed the problems as they saw them. I might also add that the Governor of California's office called us back about a year later, right after Proposition 13. We thought there wouldn't be anybody interested in talking about this subject so soon after that. So I wouldn't rule out anything as a possibility, because ultimately the approval of a processing site will depend on the political atmosphere and economic climate.

NYHART: I don't know how many of you saw -- I think it was in yesterday's New York Times -- a squib about a group that looked like the beginning of a coalition in California of pro-industry technology development forces, formed to address the problems raised by policies such as the EPA non-degradation policy or the trade-off policies, which are thought by industry to present barriers to development of new heavy industry in so-called frontier areas. So I think that in some of these coastal states there are pro-development or pro-continuation or pro-technology forces coalescing.

SILVERMAN: I have a question about that. One of my great concerns is whether or not the desire for this new industry will spearhead a general weakening of environmental laws -- whether the industry people see themselves as attacking the clean air acts, or, let's say, the Resource Recovery Act that deals with land fills and protecting ground water, or the Marine Sanctuary Act which deals with ocean dumping; whether you folks see it as your role in the interests of the industry

to attack those laws in the forefront, or whether you see yourselves as providing some new model for industry.

WELLING: I certainly wouldn't want to be put in the position of having industry attack the going environmental direction. We are supporting, on our own company money, environmental research work that we feel will make us more intelligent about what our position should be, because we've got to be sure that our R&D work is in the direction of the best ecological/environmental approach. On the other hand, we've all witnessed instances where the enforcement of some of the regulatory procedures has had a negative instead of a positive environmental effect. We look at it in the same way as we do the possibility of taking the tailings back to the sea, where we are balancing the positive and negative aspects against land disposal. Our indication so far is that it might be a very desirable thing to do, but until we get more information, we can't say which direction we should go. But to take a stand that any so-called ocean dumping is bad is, I think, as irresponsible as industry approaches taken without complete knowledge of the environmental effects.

SILVERMAN: Well, the law right now doesn't say you can't ocean dump; it says you've got to meet a certain number of criteria. The question I have is, do you see yourself politically as trying to weaken those criteria, change the law, alter the regulations?

WELLING: So far, our studies indicate we can more than meet the present requirements. We want to get more information and more facts -- we can see a possible trend in tightening them beyond reason.

FRISHMAN: This brings us to an interesting question that's spread throughout our conversations here, the question of weighing the scientific end of what is being proposed against the public perception of what the impact will be. And from my knowledge, the people who are looking into this industry are not undertaking almost futile efforts to change that. In any case, it's not cost effective. So I think their efforts are to understand what the effects of disposal will be under given conditions, and I really think the industry is looking at all the conditions. The issue I raised was the apparent optimism over ocean dumping, when I don't see any reason for that optimism. I'm not saying that it's a good or bad process, because the data really isn't in. Regardless of what data you might collect and however you assert that you meet the performance standards, you're still going to gave a public that has already been trained that ocean dumping is bad, no matter what.

WELLING: I understand that thoroughly.

FRISHMAN: And they'll insist that a full-project EIS be developed, meaning mining through processing. If some people can take an EIS and find it faulty because it is not a full-project EIS, just because they

don't like ocean dumping and it includes that, they can essentially bomb your whole project for a couple of years, based just on the legal sufficiency of the EIS.

WELLING: We recognize that and agree with what you're saying. For that reason, we feel that in addition to doing our own work, we must also work closely with NOAA. We know that a two, three, or four-year period of this kind of effort is necessary. It would be bad business for us, bad investment, to proceed in a direction in which we felt that the risks were so high that we would not be able to achieve our operational mode.

LANE: I'd like to add also that NOAA has started to work with EPA and the Bureau of Mines on tailing research, with plans to examine the ocean dumping and land disposal alternatives. Of course, a permit for ocean dumping would certainly not be granted without also examining the various ways in which tailings could be disposed of on land. We have also entered into a dialogue with the industry on this subject.

I'd like to bring up another point which has not been mentioned this afternoon. Everybody knows that when you don't meet a need one way, you have to do it another. For example, if you don't get your metals from nodules, you're going to have to get them from land sources which, in turn, involves mining ever-diminishing grades of ore. So in questioning the environmental impact of this new industry, one must really ask, how does it compare with the alternative of not permitting this new industry to get underway and continuing to rely on land sources? The new regulations just published by CEQ emphasize that the EIS is supposed to be used as a tool for decision-making. But we must truly examine the "no-action" alternative.

FLIPSE: Could I inject just one thought on this? If you heard Ed Bruce last night, you know how the court can be used to delay a permit decision for years. For the environmentalists present, I congratulate you; you've won. Regardless of the final decision, delay is the victory. For instance, Dow recently dropped expansion plans in the San Francisco Bay area; after 9 million dollars and seven years of permit haggling, they decided if they couldn't expand the plant they'd shrink what was there. That's when the emotion really started to generate. But the point is that these delays and the misuse of the court -- and I choose that term advisedly -- punish private enterprise. In Europe, two countries now say that if you start an environmental suit and it's without merit, you then pay the damages. It could cause some budget adjustments for some of the environmental groups if it ever happens here.

Another concern is that environmental requirements are a "moving target." You can change the rules, but industry is not supposed to. We're not going to attack the standards; that's unrealistic and a losing fight, we know that. But are environmentalists going to change the standards? Yes, the minute they can. In fact, a lot of the

environmental standards are ratcheted on a time frame, so if you can make the distance between bases longer when we're running them, I can't understand why it concerns you if we try to shorten them up.

NYHART: Wait a minute, Jack. You have to look at the court-shopping that the industry does. Both sides play that game, not only the environmentalists. All of the hazardous substances safety standards were just overturned by a Louisiana Judge in the Manufacturing Chemists Association, in which they found a court that -- I think it is probably fair to say -- was at least going to be receptive to overturning those EPA standards. That threw the whole hazardous substances movement into a turmoil. Congress did react very quickly and bailed the EPA out.

FRISHMAN: But the game isn't over because Louisiana, like Texas, will take its time deciding whether it wants to live by federal standards or not.

MOULTON: I did want to comment on your remark about some foreign countries penalizing those who bring frivolous suits. There's plenty of American case law that permits courts to penalize those who bring frivolous suits, and I think the fact that you aren't seeing it as often as you'd like is an indication that the court may feel that these cases are not as frivolous as you do.

The second thing I'd like to say concerns the ratcheting. I think you're right that it causes tremendous problems for industry to have the rules changed in the middle of the game, but often the problem for industry is greater because they've been playing it as close to the line as they possibly can, without allowing for a margin of safety with respect, for example, to public health.

What can citizens do to affect that? Maybe one way to get at this is to have Mr. Welling conjure up in his mind the worst case, from his point of view, for citizens. You've studied the subject much more than the layman who's in a town somewhere and suddenly hears that a new industry is going to be sited nearby. You've already gone through much of this tremendous education process that everyone has to go through. I wonder if you could tick off a few of the issues you have already identified that should be of major concern to citizens, including the benefits as well as the costs.

WELLING: Well, I'll try. The problem with the siting of any commercial or public facility, whether it be an airport, a processing plant, or, for instance, a prison, is that people all want them but they want them somewhere else. The logical approach is to put them where people have already agreed to having an industrial facility. Usually the citizens will not object strenuously to an additional facility where, say, a refinery or a chemical plant already exists, particularly if the community is interested in the extra jobs. But even if one can put the plant at some remote location, there are other problems such as much higher costs because you lack the infrastructure to support it. As

I pointed out earlier, we have always felt that it may be difficult to put the plant in the coastal zone because of the many restrictions in that area.

The only experience we've had is with the pilot plant itself. We looked into areas such as California, Oregon, Washington, Texas, Louisiana, and Hawaii, trying to get a feel for the process of getting permits and rating each state as to the degree of resistance or acceptance. And naturally it became apparent to us that because of the long transit distance the West Coast and Hawaii were the economically logical places. In terms of environmental acceptance, though, and the aid we were getting in obtaining the permits, we saw that Hawaii offered us an environment in which we could meet our time scale. In some states the permit process would be entirely too long, so we had to exclude them even though there might have been other reasons to consider them.

It boils down to the practical problem of finding out what the environment is and how much time it takes to get the permits -- will they be sequential or parallel -- and whether you have general acceptance by the public.

Maybe I've not answered your question, but I'm just trying to relate the experience I've had.

FRISHMAN: There's another whole side where I know there has been some work done, and that's looking at the impacts you're going to have on the community itself in terms of numbers of people, the types of services that are going to be necessary, where the labor force will come from, where it will go after the construction phase, and so on. And the one area that is still a very tough one in your project and others, just on the siting question, is the necessity for a relatively short-term public service system, where the taxpayers are going to have to essentially front the money to take care of your short-term perturbation, and then a much longer-term increase in the system. And this is where you start building some of the resentment that you see for industry siting. An additional resentment in rural areas especially -- and you've looked at it a little bit, I know -- is the whole question of changing social structures because of the people that you bring in. I think these are the kinds of questions that you were referring to, aren't they?

MOULTON: That's right. But Mr. Welling did a good job of ticking off the problems for industry.

From a citizen's point of view, I would suggest that in a state that has grappled with a lot of these environmental issues already and which, therefore, may have a more sophisticated regulatory regime in place, the citizens may feel more confidence than in a place where you're imposing a whole new industry and they have to start from scratch, coming up with regulations that they don't yet have. Sometimes, from the citizen's point of view, it's better for industry to have to go through these regulatory hoops.

GRABBE: Could I respond on behalf of Hawaii? The reason the permitting time is shorter in Hawaii is, first of all, that we have two levels of government, the state and the county. In some areas, for example, the Department of Health handles the health problems for the state, so only one agency is involved.

Second, we have made a definite effort to streamline the permitting process. In other words, documents prepared for one agency would meet the permitting needs of other agencies.

In informing the public, our assessment team gave many talks and speeches before we published our manganese nodule report. Many of the early responses we received were on an emotional level. Citizens are naturally concerned with new developments about which they lack information. After we distributed our report -- a lot of the information in this came from NOAA documents which generally aren't available in quantities for individual citizens -- the questions were fewer on the emotional level and more on specifics.

WELLING: I think I did not quite answer the question about citizen concerns, but in the case of the Hawaii situation, it was well debated; the citizen had a chance to bring in all his concerns before the permit process was started.

LANE: I'd also like to comment about these permits. In other words, the more complicated it is, the more hoops you have to go through, the better. I realize you were oversimplifying it, but as one who works for the federal government, I am often on the receiving end of such comments about the "bureaucracy" and all the permits and paperwork that go with it. I'd like to point out that one good thing that has come out in the last few months is the new set of regulations from CEQ, which encourages the feds to work together with the state. They encourage joint hearings, joint reports, joint notices, and so forth; the trend is more and more towards the "one-stop" approach. We're not getting rid of the many permit requirements; we're just trying to handle them in a way that involves less time and duplication.

FRISHMAN: We've run into a problem, though. Logically the one-stop approach seems to be the most efficient, and if you have the right czar running the system, then everything should work out okay. But when you start designing one-stop shopping, industry is afraid that it will have less predictability than the fancy system of hoops that they're jumping through right now. It's a conservative approach. They think they know the system they're in now, and they're not particularly interested in getting into one where there's a possibility of one person saying no one time and meaning it. We've been through this in Texas, Louisiana, and a number of other states, and it's almost useless to try to consolidate permitting to any great extent because industry turns out to be the biggest resister in the end, even though that's what they said they wanted in the beginning.

LANE: This term "one-stop approach" means too many things to too many people, and I'm sorry I used it. All I meant was that we would try to have the requirements of two agencies combined where possible. And I was trying to say there is a beneficial "trend" towards one-stop -- I don't think you'll ever get the one-stop.

KARL JUGEL, NOAA: I think I'd like to ask Jack and Connie a loaded question. In the case of siting, what is your approach to solving some of the so-called dilemmas that could be involved? That is, if you're going to use the tailings pond for onshore waste disposal, you have to have a climate which allows for evaporation. Have you looked at the West Coast? From northern California northward you really don't have areas like that near shore. If you get down to San Francisco Bay are and south, you start running into air quality problems, particularly in the L.A. Basin. Now, you look at Hawaii and they have the wet and the dry sides of the islands, and frequently the dry sides are where the tourist development is, as opposed to industrial development. So just what approach are you taking in looking at the physical characteristics of these areas?

WELLING: We certainly were well aware of the problems you cited. What we did with tailings was to list all these factors, such as net yearly evaporation rate, which in the Bay Area is 28 to 35 inches. It's not easy to find a combination of factors that are positive enough to overcome some of the negatives. As you mentioned, Southern California does not present a good case from the point of view of the overpopulation and overindustrialization of many areas.

We also have the economic problem. In Oregon, one of the ways of getting around it is to pump the tailings over the Cascades to the drier section. Economically, that is not attractive because of the transportation cost. In the case of Hawaii, the distances to the dry areas are relatively short, so that you can choose a favorable net evaporation area.

So again, one of the factors in choosing the Hawaii location was opportunity for a test where we would experiment with various approaches to the tailings problem. One is land disposal, which might be beneficial because lava flows have carried off the manganese. How much material could be safely used on the lands to make them usable, even though this might take 100 years?

Second, we want to look not only at disposal at sea, but also at all other possibilities for handling the tailings. The best way to do that is in conjunction with studies already being made and by contracting with universities for further research. We've a contract with the University of Hawaii, and with other universities in the U.S., for studies and experimental work -- MIT, Cal Tech and so forth -- in order to give us various approaches, because we may end up with a mixed bag. We may end up doing -- in fact, we already do -- certain chemical conditioning of the tailings.

We do not have the answers, but I feel that with this varied approach

and with the experimental plant, in several years we will come up with a satisfactory answer in terms not only of site location, but also of the environmental effects.

MIRIAM LEVERING, Ocean Education Project: My question doesn't relate so much to that as to my own concern that we might have less siting problems if we had a greater amount of conservation in this country. I would love to see you people in industry making a tremendous amount of money out of reducing industrial debris -- more recycling, collecting junk metals from various places, or whatever. I suppose I was one of those that sort of laughed at Rachel Carson when she first came on the scene. But I have lived in one spot of land since 1939, and when I first came there, walking between my house and the mailbox, I heard three kinds of vireos -- there were the chimney swifts, there were the redstarts, there were all kinds of birds on the land. Well, they're not there now, and we ourselves may be partly to blame because we have been pouring chemicals on our land and one thing and another. It would have fascinated me this afternoon if there had been somebody from the National Academy of Sciences giving us ideas on how we could become less dependent on advancing industry. I certainly haven't been as good to the land as I should have been over these years. But I don't feel we can overemphasize that. So if any of you people have ideas on how less can be more in our society, that's what I'd love to hear.

FRISHMAN: What you're expressing, I think, is one of the goals of those who are seen as the opposition to various types of projects, not necessarily just this type. And I tend to view the haggling over individual environmental standards as just being a ploy for industry to keep people -- and governments, too, sometimes -- from asking the real questions we need to ask, which are those related to growth in various areas. The opposition includes that group that says growth is not necessarily good, but at the same time, we're consuming at a rate even faster than we're growing. So this is an area that needs to be understood by both the proponents and the regulators of growth. Questioning the value of growth is legitimate now, though it never used to be. And it's to the point where you can become geographic about it, saying some areas may be better suited for growth than others. Some types of resource utilization may be better than others, depending on conservation needs, real consumption needs, or whether there's the potential for recycling.

One of the big problems with manganese is we're recycling too much of it, and I think that becomes a market problem. I certainly don't fault the industry for doing it.

FLIPSE: I would like to point out again that the United States practice is to use 14 pounds of manganese per ton of steel. European practice is about 22 pounds, and the U.S.S.R., which holds the largest terrestrial deposits of manganese in the world, considers that 30 pounds of manganese is needed per ton of steel. So although it isn't obvious,

there has been some excellent research work done in an attempt to reduce manganese consumption. Back to the general topic, I don't think there is any fundamental desire within industry to fool the public. The public today is much too sophisticated. Certainly in the ocean mining business we've involved the public and the academic institutions to an unbelievable degree. I think Amor Lane would admit there wouldn't have been a DOMES program if we hadn't started it as part of our R&D program to bring the academic groups out to try to do some evaluation work and to develop understanding.

GRABBE: Steve referred to conservation and recycling and the relation to markets. Small is Beautiful is a theme that Hawaii is promoting in the energy field. We're supporting small appropriate energy technology; that is, generating energy locally and using it there. And we're trying to develop a conservation ethic, but we think it takes a generation or so to instill this. General Motors has found out, for example, that the older people still buy the big cars. Younger people are buying the smaller cars.

However, the point I want to make concerns markets. In Hawaii we're striving for complete energy self-sufficiency. But all of the alternate energy devices like solar water heaters or windmills or almost anything you can think of, even though they're small and beautiful and replace a bigger system, still require copper and steel and other metals. So we're still going to need the metals.

MAXWELL MCKNIGHT, Marine Technology Society: I'd like to get back to the legal regime for a moment. Professor Nyhart has told us about the LOS problems. The effort to reach a treaty has been called the longest floating crap game on record, and it will probably still take some time. And following that, you have the advice and consent of the Senate, which will probably also take time. Meanwhile, as has been mentioned, there is some legislation pending from the last Congress, to be reintroduced in this Congress, to set up an interim legal regime to enable the American consortium, at least, to operate in the deep-sea area.

In view of this, Connie, what's your time schedule, and do you anticipate getting sufficient legislation to proceed with your construction of this site in Hawaii?

WELLING: We were very disappointed, of course, that legislation wasn't passed last year. As I pointed out, we would not be able to make an investment decision anyway until the early eighties. Once legislation is passed and the agency is set up to regulate the industry, it's going to take several years to set forth the regulatory procedures and solve the environmental equation, which will delay us further. When we do make the investment decision, we must know what the business environment we're going to be working in will be.

So at present, the best answer I can give is that if legislation is passed this year, we hope that the regulatory agencies and procedures

will be set up so that they can issue us licenses and permits not later than 1981-1982. We won't make any investment decisions until then simply because it would be bad business to do so. After that, it will take at least four years to have the plant operating. So 1986-87 is the soonest that we could get into operation, if everything is favorable. Even if we had all the technical problems solved today, we could not proceed.

We tried to have government, state, and federal agencies, the environmental interest, the industrial interest, and the academic community adequately represented on our panel. But have we reached any conclusion? We haven't really answered Al Keil's question, Is the United States ready for a marine industrial park? In terms of legislation and the permitting procedure, the answer is that there's no thrust in the United States that I can see for that.

The fundamental question that John Craven brought out last night was, why don't we turn to the sea and live there, work there, and adapt to it? Why don't we, as a country, utilize the assets of shorefront industrial development, intelligently done, protecting the environment, the aesthetics? Somebody said, the greatest thing about ocean mining is that you'll never see it. Not even the discharge from the ship. But are we as a society sophisticated enough to consider a marine industrial park?

GRABBE: The answer is Yes, put it in New Mexico!

FLIPSE: You touch, Gene, on a point that we raised yesterday. There must be benefits in this and there must be costs, and one of the things we've found out is that the fellow who gets the benefits isn't necessarily the one who pays the costs. There is an inequity that's very natural in these developments. Can that be prevented? Certainly not by legislation. The legislative assistant would then get the benefits.

DYER: I think our society is moving towards recognition of the inequities through various compensation schemes. Until very recently we observed principles of ownership that we were brought up on. But it is possible, as has happened in the OCS Amendments Act, to build into the system some compensation that recognizes just those factors that you mentioned. For example, it is possible by modes of taxation and payment, environmental penalty funds, and so forth, to recognize those whose sense of aesthetic contentment may be violated by the appearance of a processing plant between a picture window and the sea. It may well be that our society is moving that way.

SILVERMAN: I followed the legislation last year, and I think I spoke to most of the people who opposed it and some of the people who favored it. I'd like to report to you my impression of the reasons for the opposition and the problems.

First of all, no one that I spoke with -- really no one, and I spoke

with many groups -- opposes exploiting the wealth of the sea. But some of the concerns were not answered adequately. For instance, the legislation extends diplomatic protection to the United States. I don't really know what that means. I don't know what it means in military requirements or to what extent it commits the nation's foreign policies. I think there are a lot of people, in the Senate particularly, who were concerned about that, and I don't think it was adequately addressed.

A second area where the work was very poor was in the relationship between the legislation and the other pieces of legislation. I was involved in it because someone asked my opinion as an attorney about how it related to the Clean Air Act, particularly the permit requirements. I couldn't give an answer, and I don't think that was spelled out. Nor was it spelled out how the legislation relates to OSHA, and to a lot of other things. I think someone should address such questions very systematically as part of good legal work.

Further, the metals that we talk about as resources and hard metals -- particularly the trace metals -- are thought of in certain circles as heavy metals or toxics, and they have a very bad name. I think we'd like to know the impact of breaking up the cadmium or the arsenic and putting it in a slurry or wherever. Nobody addressed that question during the hearings, but I know a lot of people asked it.

As for our sessions here, I think what Ms. Levering mentioned about resource conservation is a key concern. I think the idea of wasting all this manganese, particularly if you waste it irretrievably, really troubles a lot of people.

Then there's antitrust -- we didn't talk about that today, but Senator Kennedy and the Judiciary Committee were primary obstacles to the passing of this legislation; I think they had some questions about antitrust and I think that needs to be addressed outright.

And finally, the effect of the manganese nodule industry on the oceans I think still needs very close scrutiny. There are a lot of people who worry about what's happening with the oceans, especially when they think that once we start mining, many others will start mining as well.

If I were opposed to this legislation or opposed to the idea of mining I wouldn't tell you all this, because these were the strong points of the opposition. But I hope they can all be answered.

CHARLES MATTHEWS, National Ocean Industries Association: You were talking about a marine industrial park. Are you thinking in terms of, say, Spillhouse's concept of artificial islands offshore? Is this the direction we should be going, seaward expansion, that kind of thing? Or are you talking about an onshore industrial park that would be devoted exclusively to a marine activity, perhaps deep-sea mining and offshore oil and gas development with support facilities?

FLIPSE: I'll be glad to answer that. I think Al Keil's experience in Europe with Europort and the creation of offshore islands, the floating plants, and so on, is a tremendous technical stimulus for

cooperative development. Al couldn't believe that we had a group of people who were concerned with where you would put a nodule processing plant who wouldn't see the value of a marine industrial complex. And he was delighted to hear that a petrochemical plant would be a good tie-in plant. He saw an American "Europort" developing somewhere, again, in New Mexico -- anywhere but in our own backyard. He thought that if we could get this idea into the discussion of the Forum, the next discussion would be more constructive and the problems would be faced and the trade-offs made. If it's so right for them, is it so wrong for us? But in the United States, the use of the waterfront for industrial development is almost impossible. Is this a pendulum that will swing back? Industry isn't going to intentionally try to make that happen, but it is almost a normal reaction in due time. There's a lot of interest now in the cost of the environmental improvements that we're getting. What are the costs for the next increment of environmental protection? That focus is perhaps a symptom of this reaction.

LOIS SHARPE: I've been in this process so long that I think it's not useful to engage in this kind of debate. But the pendulum does swing -- I've seen it swing a number of times since I began working on water questions in 1960. And as you say, many people are now questioning the cost of this environmental protection. Resources for the Future -- which is a reputable organization, not even really an environmental one -- has reviewed recent opinion polls on the public's attitude toward the preservation of environmental controls versus a reduction in the standards. And the results they report are strongly in favor of continuing those high standards. The public does not really feel as confident as you gentlemen do about the good intentions of industry in this respect.

NYHART: Ms. Sharpe, before you spoke I was thinking that I had heard a lot of things that could be reasonably optimistic. One is that the pro-development, pro-technology forces are stating their case. And there is time, I think, to hash these issues out. There are a lot of weaknesses, a lot that is fuzzy, I think, in the legislation. And certainly these things need to be discussed and resolved.

But at least they're out on the table -- you listed them, other people are listing them in other forums. I think it is significant that Connie Welling has responded here by saying, Look, it's good business to direct my R&D in anticipation of these issues. I think that's cause for optimism, the fact that we have almost a decade in which to work these issues through. As Ira Dyer pointed out a moment ago, there are economic tools at hand to try to balance the external considerations with the industry ones. There is the work that Amor Lane is doing and that other parts of the Department of Commerce are doing, trying to identify and perhaps quantify the national interest in this endeavor. The fact that we have a forum today I think is a cause for optimism.

WELLING: Regardless of whether one thinks we have good intentions or

not, the fact is we could not afford a four-year delay like the one experienced by the Alaska pipeline. We must be sure that we are going to be environmentally acceptable and meet the regulations.

NYHART: It is certain -- and I think industry realizes this -- that if these issues are not thrashed out in advance they will be settled in the courts. We have enough experience now to know that even if you use an existing processing plant, the existing plant is going to require a Corps of Engineers permit. And once you call for a Corps of Engineers permit you're in the EIS, the whole review, creating ample opportunity for these issues to be litigated and to bring out the costly delay that Mr. Welling is talking about.

GRABBE: A point that no one has mentioned is schedules -- when will the first operational mining system begin and when will the first processing plant be built? They have to go together. In Hawaii, we estimate this will be sometime after 1985, which gives us five more years to examine and look at the processes to inform our legislators and the public, the environmental groups, and so forth. Is this a reasonable assumption, Connie?

WELLING: I'll say that we have to get it settled within three or four years, not five, because we may have to make an investment decision before then.

FLIPSE: Five years ago I would have said the same thing. I regret to report that the Kennecott operation has been reduced by 95 percent; the INCO operation, although highly successful in its technical experimentation, has been reduced by over 80 percent; and the Deepsea operation is facing the very serious decision of whether to continue or go on the shelf now. It's just as wrong to be early as late, and we're all congratulating Connie on his early problems that may turn out to be later blessings.

WELLING: But don't congratulate me too soon. Without legislation this year, I doubt whether I can keep up the present pace.

FLIPSE: There is at least a four-year minimum from economic feasibility to production. The legislation will provide an estimating basis for use in the payout study to determine whether it's worth investing. Otherwise, it rolls over one more year. The result, at least in three out of the four American undertakings, are in doubt just on this time line problem.

JOHN McNALLY, Clean Water Action Project: I've got one or two things I'd like to bring up. First, I'd like to hear the panel's feedback on the Department of Defense study that stated that they didn't feel there'd be any need to go for alternate sources of metals for quite some time -- they mentioned supplies of 62 years of copper, 220 years of

manganese, and 69 years of nickel. In sum, the Assistant Secretary said, "In the DOD point of view there seems no immediate need for a mineral resource in deep-seabed mining."

Second, we mentioned sister projects where activities in one area might dovetail with those in another. I'm just curious if anybody on the panel or in the audience knows whether there's been any investigation into the possibilities of utilizing -- perhaps by some kind of deep-seabed farming -- the nutrient-rich ooze that would be brought up by mining techniques to stimulate production of plankton. This might be zooplankton such as krill, which is very nutrient-rich and could possibly be an alternate food source.

LANE: I've got two answers for the nutrient one. First of all, there is a project down in St. Croix by Oswald Roels, who was an early deepsea mine investigator who was trying to demonstrate the feasibility of bringing up deep water with nutrients for aquaculture.

FLIPSE: And air conditioning.

LANE: Yes, and air conditioning. Now, as far as the deepsea mining itself, there were some initial thoughts that perhaps the level of nutrients that would be dumped overboard -- that is, brought up from the mining pipe -- would be sufficiently strong that you could have some kind of fish farming out there. But we haven't seen evidence of that high a level of nutrients in the discharge plume.

GRABBE: There's another experiment going on at Dana Point off California where they're bringing up deepsea water in an attempt to grow kelp. When you bring up the sludge from the bottom, you have a double effect: nutrients which can react with sunlight to form phytoplankton and other materials which make the water opaque so the sunlight may not penetrate as deeply. Although they may tend to counteract each other, we believe the overall effect may be beneficial.

LANE: One of the purposes of DOMES is to find out the extent of the surface plume. But we must keep in mind that current tests are demonstration-scale. In attempting to extrapolate the results to commercial-scale operations, we must use caution. Nevertheless, from what we have found, the diminishing of light becomes slight to the vanishing point in the upper waters. That is, we'll have a plume that may extend five kilometers in these scale-up experiments. The plume is relatively small and disappears in a couple of days.

Now as far as the particulates in the plume, we're investigating these from two points of view. One is the level of metals that might be taken into the food chain through zooplankton. But the other is the "food" value of these particulates to the plankton. For example, if they're eating these particles instead of real nutrients, they may be gorged, but they're not nourished and may die prematurely.

WELLING: I have studied this problem for a number of years, and in fact was asked by the National Materials Policy Commission some years ago to do a study on ocean minerals and their strategic importance to the United States. In reporting my findings at that time, I experienced no disagreement, but they're certainly 180 degrees from the findings that I undertand DOD has come up with. If you look at the data, we are importing all our manganese, and all our cobalt, and practically all our nickel, and the trends in copper are such -- other studies have supported this -- that probably by the year 2000 we'll be importing half of our copper.

Now, one can argue as to the total effect upon the economy -- I've indicated in my studies, for example, that the savings and the balance of payments in the United States between now and the end of the century, if we can get ocean mining started in the 1980's, would be on the order of 40 billion dollars. This would be a saving of several billion dollars a year. The more important factor, though, is the fact that these are strategic materials -- as we mentioned, you cannot manufacture steel without manganese. And the demand upon cobalt is increasing all the time due to the need for it, for instance in jet engines; the U.S. is a major supplier of jet aircraft. The fact is that the energy requirements to mine lower-quality ores are considerable. The Department of Defense report did not cite the Geological Survey study that indicated that between the years 2020 and 2040, when most people agree petroleum production will be quite downhill -- it will peak somewhere early in the next century ---the requirements for these metals will exceed by an order of magnitude what we normally think we will need. Therefore, unless we have a timely development of strategic metals, we will not be able to meet our energy needs. In spite of the fact that we recycle at least half of our copper and 25 or 30 percent of our nickel, and that we recycle more all the time, the need will still be there.

NYHART: I would only add that it is my understanding that a recent government study within the Department of Commerce policy office, trying to define the national interest in deep ocean mining, has come up with a long-term (20-year) manganese supply as the critical element of national interest. I think the people doing that study took a fairly independent look at the thing. I don't know the DOD study to which you referred, but I know within the last six to eight months there has been another government study that has basically supported the position that you just heard from Mr. Welling.

FRISHMAN: This means that we're going to have all the national interest arguments in developing the industry focused on a portion of it that the industry doesn't even plan to use right now.

WELLING: Let me again point out that there is a certain level of manganese that you absolutely have to have. Above that level, you don't need it.

FLIPSE: And it's an inflexible market.

WELLING: It's an inflexible market. But in order to meet the nickel, copper, and cobalt needs, you have to produce far more of those metals than the amount of manganese you need. So the manganese is accumulated on the bottom of the ocean at a much faster rate than you can conceivably use it in the next century. It isn't a question of wasting resources at all; in fact, they're even putting it back there.

HAROLD HARTLEY, United Methodist Law of the Sea Project: Another citizen concern that has not been dealt with today is an international perspective and the common heritage principle. With a unilateral agreement prior to an international treaty, how will industry guarantee a significant revenue-sharing system to benefit the developing states?

FLIPSE: That is an interesting question, but we are now out of time.

LESSONS OF THE CASES

INTRODUCTION

Alfred A. H. Keil
Co-Chairman

Now that we have discussed the four cases, in order to learn from those actual experiences about the interaction between seaward development and citizen participation, we should identify and summarize lessons learned from them. Each case leader will summarize key points for the review of his team and the comments of the audience. We then will see whether there are some common elements that we can identify and general conclusions that we can reach.

REPORT ON GEORGES BANK CASE STUDY

Ira Dyer
Co-Leader

I think that the Georges Bank case can be characterized as follows:

While Georges Bank may have economically valuable stores of oil and gas, it is known to have an economically valuable supply of fish.

If we do go ahead and take oil and gas from Georges Bank there will be an environmental change; agreement does not now exist on the benefit or disbenefit of that environmental change.

As the individual, individuals, or entities in charge of the Georges Bank situation are difficult to define, decision-making for the area is a very difficult process. Yet in some sense, perhaps in a large sense, most of us in our society have come to expect more generally a crisp decision-making process.

Now, given that to be the bare bones of the Georges Bank case, what can I conclude from our discussions? Here are a few points that I would like to bring to you.

With respect to the last issue that was raised, namely, the nature of the management process and the decision-making process, it does seem to me that it is a process of decision-making under a great deal of uncertainty, one in which it is largely impossible in sensible quantitative terms to play out a scenario that we can all agree on. Even if we can agree on a scenario and its outcome, we would not necessarily be good predictors of the future.

With the recent enactment of legislation by Congress there appeared in the OCS Amendments Act terms of compensation for harm that may ensue to competing interests in Georges Bank, which I personally view optimistically. Along with that, there is the option to cease operations on Georges Bank, also viewed in an optimistic mode. That is to say, I believe our society is taking a step forward in its management and decison-making processes by recognizing that not all future events can be predicted with precision, and that we are going to recognize that whatever harm might ensue out of mistaken predictions will somehow be taken into account in the process of managing that resource and regulating that development.

Another point that seems to be related to the process of decision-making with respect to the Georges Bank is the way in which competing interests might be taken into account. It does seem to me that as a society we are not well equipped to discuss in a public forum or to enter into public debates in as useful a way as we might like. We are as a public, as a society, not as well-informed as we might be about, on the one hand, the nature of the environment, and on the other hand, the opportunities in the environment. It may well be a responsibility of our society to do something about educating that larger public in ways that enable us to deal more effectively in the future with questions that concern the interaction of technology with society, economics and resource economics most particularly. I am, generally speaking, an optimistic soul, and I do believe that while it may take a long time to achieve that better sense of information, that better degree of knowledge, it is the direction we ought to take, even though it may well involve an enormous effort.

As a final point with respect to Georges Bank, there will be created a series of regulations. Regulations that are written with respect to any development project can be of two types. They can be written in terms of objectives, that is to say, what do we wish to achieve; or they

can be written in terms of minimum standards. It seems to me that we ought to urge regulations that are of the former quality. Regulations that are of the latter quality, namely, minimum standards of technology, often have or seem to have the characteristic that they stifle technological innovation, whereas regulations written in the form of objectives can often motivate technological innovation. I would suggest that is what we want to achieve, namely, we would like to see in each process a further evolution of technology that may be used in some subsequent development.

REPORT ON GEORGES BANK CASE STUDY

Don E. Kash
Co-Leader

The first thing that strikes me about the Georges Bank case is the confusion derived from the complexity of the issues involved. There is a mixture of competing values. Those values range across a spectrum from slower economic development and a preference toward maintaining things pretty much as they are to a preference for rapid development.

There is equal confusion about the facts. That confusion is associated with uncertainty about the technologies and processes involved in finding and getting the oil and gas out, and perhaps the greatest uncertainty revolves around what the impacts would be of oil and gas development, independent of whether they are viewed as positive or negative.

One reason for the confusion is that we are dealing with a very complex, interdependent set of choices and we live in a world whose complexity has passed beyond our intellectual equipment. We try to understand the Georges Bank issue by breaking it into bits and pieces. We try to understand it in the way we generally understand in a scientific society, that is, by analysis. That means breaking it into components, each of which can be made understandable. And yet, Georges Bank is a case where what you are looking at is a whole, a lot of bits and pieces put together.

We try to manage with organizations that are the derivatives of the way we understand the world. That is, we try to manage it with bureaucratic procedural arrangements which assume that you can break out pieces, and make choices with regard to those pieces. Yet, when you get all the pieces broken out, you somehow don't have the whole. In a sense, we are trying to understand and manage with an analytical system, and we have a synthetic problem.

The upshot is a great deal of confusion, and the debate is not as informative as it might be. I made the comment in our case session that I thought we had devoted a disproportionate amount of time to talking about oil spills. I think we did that because although people disagreed about how much oil would be spilled and what the consequences would be,

it was at least something that you could try to get your head around, and there was some set of common, factual data. Dr. Keil suggested some work done by a colleague of his, Mr. Devanney, and he said that one of the useful things in connection with that work was to lay out the facts of the case. He indicated that lots of people had used those facts. I think that is generally correct, but in the Georges Bank case, if you look at it overall, it hasn't done a whole lot of good. We seem to be able to proceed with seaward develoment, particularly oil and gas development, without much difficulty if it takes place in the Gulf of Mexico or off the coast of Georgia. The key reason for a sale taking place relatively easily off Georgia and not on Georges Bank appears to be associated with the fact that there is a greater span of values at work in New England than there is in Georgia. My general perception would be that in the Gulf and off Georgia there is a broader community of interest committed to economic development.

Generally it seems to me that public participation is something we are going for as a direct result of the increasing lack of confidence in our governmental system by a wide range of interests in this society. We are supposed to have a representative government. If government were seen as effectively representing, we wouldn't have to have all these procedures for letting every ad hoc special interest group participate in the system. I think Georges Bank reflects just another one of those instances of a declining confidence in government and in the processes of governmental decision-making.

Public participation is being proposed as a substitute for governmental decision-making in part because of that lack of confidence. This results in part from the confusion, uncertainty and lack of understanding to which I referred. The view of interested parties is that the only way they can have any confidence that their interests will be protected is if they get to participate continually. That is almost a necessity where there is both uncertainty about what the consequences are going to be and a lack of confidence in the formal institutions and procedures of government.

One of the things that public participation represents, then, is an effort to involve vested interests at every step in the process, so that those vested interests both have a chance to get their oar in and to maintain a kind of continuing assessment as to what the consequences will be of the decision-making process that is underway.

The final impression that I have is that public participation seems to be necessary, and so we probably ought to focus on how it works best. Based upon what I have heard here, public participation works better the earlier it takes place. But it is important to emphasize that we never have public participation which involves masses of people. Rather, what we are involved in is a process that seeks to allow two categories to participate: those groups that have an interest, and alternatively, those groups that are likely to be impacted. Those groups that are likely to be impacted negatively need to be brought in at a very early stage. Frequently the groups that are impacted don't know it when the process begins.

So if public participation is to serve the function of developing a consensus and speeding decision-making, it is incumbent upon the protagonists of these developments and upon the government to make an increased effort to try to identify parties that will be impacted by the decisions to develop the Georges Bank, inform them of what is going on much earlier, and invite them into the system.

REPORT ON SOHIO AT LONG BEACH CASE STUDY

Russell R. O'Neill
Leader

In our session, we laid out very well all of the elements of the SOHIO case. We had good presentations and lively discussion.

The SOHIO project is still up in the air. Therefore, it may be a little premature to say exactly what the lessons are. We might be able to do a better job in two or three years, looking back at it.

At this stage, I find that there is some difference of opinion. There are some actors who feel that nothing has been learned, and there are other actors who feel that it has been the equivalent of a doctoral degree.

I think that one of the most significant lessons is that engineering is no longer simply a matter of designing something and then having it constructed. If that were all there were to engineering, the SOHIO example would indeed be a "piece of cake," as one of our panel members said. Constructing a terminal, a pipeline, and moving half a million barrels of oil a day around involves many other things, including values of different people. There is a certain amount of symbolism in all of this. You become involved in national politics, you become involved in the very complicated process of getting permits, which really hasn't been all worked out, and so forth. Also, there is the matter of credibility. You have got to do something that people will really believe.

One of the difficulties that might be considered a lesson is that it is difficult to define and ascertain exactly what is the national interest in this case. If you inquire, you just don't get a clearcut answer. And it makes everything that follows more difficult.

Another thing that makes this a difficult case is that SOHIO is on the cutting edge. When they started this project, one of the things that had not yet been settled exactly was the acceptable limits; these were actually negotiated as the project proceeded. That makes it much more difficult and also stretches the whole process out.

There is also this question of public participation. We now have a large number of entrances where the public can get into the permitting process. There may be too many, there may not be enough. But it seems to me that it is just a little too early to draw all the lessons from the SOHIO case.

KEIL: The question of national interest is a rather key issue. In a way it is underlying the question on the significance of the oil resources on Georges Bank and, in essence also, the significance of the fishery resource. Is one more important than the other? Is one so important that you don't have the other?

REPORT ON LOUISIANA OFFSHORE OIL PORT CASE STUDY

Stephen J. Masse
Leader

The controversial thing about the LOOP case was a noticeable lack of controversy. Perhaps in the land of the blind the one-eyed man is king. But there are lessons to be learned.

The first one is very obvious, but it has some depth to it, and that is that Louisiana is different from New England. Don mentioned regional differences, and just saying that they are different opens up more questions. Why are they different?

We have the long history of oil development, onshore and offshore development, and many pipelines. There are political differences that came out in the discussion of the state politics of Louisiana. Here we are talking about a certain period of time in this twentieth century, and even now, things are different in Louisiana than they were while the permits and licenses were being processed.

The attitude of the people is a factor, and it is a combination of all the other things I said about the differences between Louisiana and New England. The focus of the public participation group that spoke in the LOOP case study session was not how to stop the project, but getting the best for the state and for the region from this project.

I think we can link the difference to education, which was mentioned previously also. Either the people of Louisiana are being conned, or the New Englanders are, or there are differences in the facts. But knowing more about the facts will, of course, be helpful in future development. From a historical point of view, in the years that follow we can look at the environs of Louisiana and see whether these things that were accepted by the people of Louisiana were for the better or the worse.

What we found in the Louisiana case is that the accessibility and the openness of the owners and the state officials and everyone concerned did a very good job of bringing about a credibility and a rapport with all of the interests that were there. I say given the climate in Louisiana, plus the outlook that was almost universally accepted that deepwater ports are a better way to import oil than going up the rivers with the smaller ships, and the acceptance of some other benefits. I think that in Louisiana there was some trust. It is easier to argue with someone about what they are saying than to argue with them about what they are not really saying. I think there is a lesson there.

A third point is that if you get an act of Congress, and you focus massive attention on a project in terms of mandating a timetable and putting bite in it by having an operating agency to enforce and coordinate this timetable you can get things done. We had what we called the "single window concept." It was tried for the first time in a major federal legislation in the Deepwater Ports Act, where the Department of Transportation received the application and dispersed it to all the federal agencies involved and got their comments. Each agency had a deadline by which to declare all objectives to the project. That is the kind of law that was working for this project.

The law also mandated decision by a cabinet-level official. The Department of Transportation received all the inputs and said yes or no. As it turns out, there was a 25-page license full of yes.

The other point on the law is that it did cost. There was a big bill. We had over a dozen people in the Coast Guard working on it. There were people in the Office of the Secretary. At the state level the Louisiana Offshore Terminal Authority was set up to lubricate this process. Maybe this law that sets up a procedure for a specific project points toward the future when there may be a universal system that will provide this type of handling for all projects.

The fourth point that I heard from the LOOP discussion was that there was a good dialogue by all concerned on the writing of the law. Dr. St. Amant said, "We all got together and knocked heads." It was fortunate that they had informed people at an early stage and knocked heads early, because they got a relatively clean law that people weren't going to fight later.

At the federal level there was a lot of discussion, and the law came out pretty clean. So struggles came on early. And that is something I would say is a lesson from this case. If it can be worked that way, it is for the best to get nice, clean laws, and to have everyone have their say at that stage. I would say that is particularly true at the state level.

KEIL: I should just say for the record that the legislation that you refer to was the Deepwater Ports Act, which actually is not confined to the State of Louisana. It is the Deepwater Ports Act for the United States to import oil.

MASSE: There is also a law in the State of Louisana that would not affect all deepwater ports. We do have this continual partnership and coordination with the state.

KEIL: You mentioned something else that just for the record I think I would like to emphasize, and that is there was an agreement there that it was felt that the import of oil by unloading offshore at a deepwater port is environmentally safer than bringing it in in smaller ships up the river. But the other part is that it is also cheaper. The transportation costs become substantially less if you can go through a deepwater port, because you use large tankers, and the cost per barrel

is lower.

MASSE: That is a very good point. We have a marriage of something that was attractive to the oil companies from a financial point of view and helped the environment.

KEIL: I would hope it also benefits the consumer, because if oil arrives at a lower cost, then I think the consumer should also have the benefit.

REPORT ON MANGANESE NODULE PROCESSING PLANT CASE STUDY

John E. Flipse
Leader

The initial interest in manganese nodule commercial development was in about 1962. It was characterized by a very open exchange of information and attitudes between the industry, the academic community, and the government. In that sense, this was a unique opportunity for broad cooperation. There was an Interior Department Advisory Committee when only two companies were actively working the problem.

There was also work with Scripps, Lamont, and Woods Hole, and excellent cooperation with the Naval Electronics Lab who, in developing deep ocean cameras, needed a suitable subject. Fortunately, the only thing they could find at considerable depths to photograph was manganese nodules. It was an interesting coincidence and a very important development. So there was a very early broad interchange.

There were two additional concurrent events that made public participation very real. One was the extended discussions of the United Nations Law of the Sea Committee and, later, Conference. There was an industry group that was supposed to provide advice but that was being advised regularly by the U.S. Government. The function of the advisory committee was to teach the government people what ocean mining is and how it works. The government people frequently changed. It was, and still is, an intense world debate on the subject involving the public, perhaps a particular sector, but much broader than many people realize.

Then there was another educational effort leading to U.S. domestic legislation, resulting in a bookshelf of hearing records. It was the conviction of both the industry and academic people that if you could make the Congress understand the problem, you could legislate wisely. It sounds like a theoretical approach. But nevertheless, again we had the changing staffs. Every two years we had a new rack of faces, committee responsibilities, and so on. So there has been an extended educational effort or, if you will, public participation in this sector.

Another unique situation developed when the State of Hawaii decided

not to join the West Coast of the United States in saying: "No nodule processing here." A several-year intensive study enjoyed extensive public participation focused on siting a manganese nodule processing plant.

As someone said yesterday, press coverage is like the measles, so that each time they open the Law of the Sea debate, which is at least once a year and sometimes twice for the last seven years, somebody writes an article, whereupon all the other journals follow suit. In fact, the press coverage has been extensive. In our case there was an intense interest in the scientific and technical aspects of the subject. We had a hard time getting away from this in our case discussion. There are just too many interesting aspects to ocean mining. Most of the discussants were either very well grounded or absolute neophytes, so that most of the exchange was between the well-grounded persons and the members of the panel. The other thing that characterized our session was its reasonableness and its conservatism. These observations are reflected in some of the findings.

The first finding was that the industry-environmentalist relationship is improving. This was a surprising conclusion which reflects the maturity of the relationship. Supporting evidence includes the following:

The rhetoric is diminishing. Nobody from the industry feels that if you don't mine the nodules next week the world is coming to an end. Similarly, we didn't hear one person say that if you stir up a small sector of the seabed, you have done incalculable damage to the world.

The R&D programs of both the government and industry are focusing on the environmental concerns. The assurance that the industry R&D is so directed was well received by the many representatives of environmental interests. We are convinced that the distrust of the environmental community of ocean mining is decreasing because of understanding and that self-confidence is increasing -- a significant development. If there is enough factual exchange between the parties and the confidence of each party increases, they can become more reasonable. There was almost a tenor of this being a cooperative effort now -- let's see how we can do this with proper environmental protection -- rather than an adversary situation.

A contributing factor is that industry is facing regulation and recognizes the strength of the environmentalists, their effectivness in the use of the court. Instead of playing the ostrich with their heads in the sand, they are facing the issues and trying to handle environmental problems realistically.

The second finding was an awareness of the physical problems of having a manganese nodule plant in an area. Attention was focused on the plant "tailings." For a typical three-metal operation, tailings approximate a square mile three feet thick each year. That is not the way it will be configured, but that is the magnitude of the mass that must be handled.

On the other hand, the tone of the discussion in this area was positive. Is this a future ore body? Should you save this material so

that later on you can come and take out some other contained values as the economics permit? Hawaii, having done its homework, wonders if these tailings could be put on barren lava flows and replace the manganese missing in the lava flow, thereby turning these barren slopes into productive fields? There is much work being done in this area.

The question of at-sea disposal was discussed in a relatively calm and constructive fashion. Should these tailings be disposed of at sea? There is research and evaluation going on to see if this is possible. The problem of tailings disposal must be properly anticipated to prevent costly and devastating later problems.

The third finding, supported by the government, the environmental, and the industry interests was the need to improve and expedite the permitting and approval procedure. Apparently nobody really believes in one-stop shopping or single-agency permitting, but better interagency coordination is essential.

Our federal government panelist made the point that interagency agreements are practical and will be effective. Most panelists agreed that it is great as long as the lead agency leads. This approach suggests there is a leader, and this unfortunately is not always the case.

Another finding was that the timetable for ocean mining is more relaxed. Passage of reasonable U.S. legislation is near. No one knows whether this is next session or two more sessions, but all agree that it has to be nearer; it has been "working" for seven years!

And Law of the Sea expectations are down. The threat of a Law of the Sea treaty that would deny access, although still very real, appears remote. The people are getting inured to a treaty "next year."

Another reason for the feeling that this is not a doomsday problem is that the metal markets are weak, and that is a fact. Then there is the high-confidence level that there is not really a metal shortage. Certainly there is not a current metal shortage, except perhaps for cobalt.

Let me depart from the euphoria of the Forum discussion to caveat these happy developments. I am worried! Two of the four major U.S. consortia in ocean mining are inactive. Their technical programs are essentially complete, and they have dismissed their engineering staffs and are not proceeding with the system development. One more is facing that decision very soon. The fourth American-led consortium, which was once considered to be "far behind," has enough testing work ahead to last a year or two.

I am concerned, too, that if the pressure is removed that the work won't get done. If there is a major political problem in Gabon with the usual military action, we could have a manganese crisis resulting in "emergency" ocean mining development, usually not the best way to do good engineering and protect the environment. Therefore, I don't share the joy that was expressed in our case discussion because the pressures are off.

The last conclusion that our group reached was the result of some severe prodding by Dr. Keil. John Craven spoke to "your movement toward

the sea" in his opening remarks. I encouraged the audience to express their opinions, without results. My conclusion is that the U.S. is not ready for a "marine industrial park." The major concern seemed to be that the new environmental legislation, the Clean Water Act, the Coastal Zone Management Act and so on, have not been shaken down to the point where this is a practical development.

A fundamental problem is the combination of two frontier technologies where either one could be a disaster. In combination, there is sure to be a disaster. Not everybody agrees with that thesis, as there is a strong interest in Japan to combine ocean mining with ocean thermal energy conversion -- an opportunity, perhaps, as the two processes are technically complementary. The keystone of the Hawaiian interest in the nodule processing plant is the possibility of "free" geothermal energy. Again, this is combining two frontier technologies.

The focus on public participation in our Forum case discussion came as close to zero as is possible. It was a good example of many cases of public participation. No one was concerned about it as a separate subject. The panelists and most of the people in the audience had been participating "publicly" to the extent that we couldn't understand why it was an issue.

KEIL: If one doesn't worry about the individual constraints that exist at any time by regulation and so on, and asks what are technical opportunities with respect to manganese processing, you come to the conclusion which Jack described. If you combine a petrochemical plant, if you don't have other cheap energy, with a manganese nodule procesing plant, you get a fantastically efficient land use, you make substantial savings on energy and purchase of raw materials and transport, because you have a lot of things that are going back and forth between the two. And if you combine it with a port capability to bring the oil to the fossil fuel plant and hydrocarbon plant, you have an industrial complex.

Now, we haven't thought about that very much in the United States, but if you look at the rest of the world, this is the way they are doing it, and it is very effective. When we look at the interface in seaward development between technical opportunities and policy-making and decision-making, one has to be aware of what the opportunities are, and what the benefits are from new ways of doing business.

OBSERVATIONS ON CITIZEN PARTICIPATION

Oliver Brooks

I participated in George Tressel's informal discussion session on citizen participation. Although the panel plus audience comprised a small group, it was interesting that it represented a nice little vignette of the vagaries of public participation. If we can liken public particpation to a drama, it was very clear that some of the

people had come in during Act I; others had come in during Act III and missed Act I and II entirely; still others had been there for Act I, had gone out at the intermission and not returned until the midle of Act III. In short, like many public participatory efforts, the level of experience and the level of perceptions were very diverse and this made communication difficult.

In addition, each person came in with his or her own particular agenda and tried to fit the discussion to the agenda rather than the reverse. This again is a problem which invariably arises in public participation.

Now, let's turn to some more specific issues. We must concern ourselves with the question of whether public participation is a means to an end, or an end in itself. It was clear in the discussion that many of the people who were there were not there because of an interest in seaward development. For example, there was a very articulate consumer attorney whose interests seemed to be grocery store items and telecommunications schedules. To him public participation was an end in itself far more than it was a means to an end. It seems to me that in the relationship of citizen particiation to seaward development, we have to come to an understanding of its basic rationale. My instincts tell me that public participation must be looked on as a means to an end -- that process, while important, should be viewed in a larger context: i.e., to encourage the development process while assuring an opportunity to impacted citizens to have their grievances aired.

But if, as the Forum has purported to do, we intend to focus the debate on public participation, we should concentrate our attention on the character and the strategies of the process rather than upon the exact nature of the ultimate development decision. As one who listened with care to the SOHIO and LOOP discussions, I found myself listening to a great deal of data on hardware and project financing and relatively little about the nuances of public participation strategies and the identification of a widely diverse set of impacted citizens.

It seems to me, as we use the term "public participation," its definition would appear to be much more in the eyes of the beholder than subject to a commonly accepted meaning. To the extent public participation was discussed in SOHIO and LOOP, it occurred to me that what we were talking about was not really public participation, but selective marketing. There is a vast difference between them.

In the SOHIO discussion, the SOHIO vice president stated reflectively that, having been through myriad public hearings, having been involved in a process that is now four years old, SOHIO had not learned anything appreciable that it didn't know at the beginning of the pre-development stage. This was startling to me, because I am convinced that the process can contribute very markedly to the identification of new and unexpected impacts or other factors that might bear on a given decision. In the SOHIO case, I was asked to believe that the corporation's preliminary analysis was so omniscient as to have identified all the key factors in advance.

Further -- and this was touched on very lightly -- one of the key

items of public participation in the SOHIO case ---that is, a referendum vote in the City of Long Beach, the host community of the proposed oil discharge facility -- was accompanied by a vigorous campaign in which $15,000 was spent by the citizens group that was troubled by the environmental implications of the project, and 50 times 15, $750,000, was spent by SOHIO, the chief protagonist of the project. But we did not talk at all about the propriety of this kind of imbalance of resources on two sides of a legitimate issue. In the debate on citizen participation, we cannot overlook such problems.

Mitigation and compensation, or to put it in more jargonese, side payments and trade-offs, have been discussed relatively little. And yet, these are items which address themselves to the impacts of a given project on citizens individually and collectively in a very sharp and very significant way. It seems to me they should be more central to a symposium of this kind.

The transaction costs of public participation should be more central to the discussion. We know that both industry and government have a great deal more in the way of resources -- financial and technical -- in a development context than do affected citizens, either individually or collectively. How far is it reasonable to expect industry or government to make specific contributions -- technical or financial -- to help redress this imbalance in the interests of encouraging a more effective public participation process? Can this be looked upon as a legitimate cost of doing business on the one hand? Or is it just mindless financing of the opposition on the other? These issues are complex indeed, but I do feel they need far more attention.

I have been struck repeatedly, and perhaps this is the nature of the cases with which we are dealing, that there has been relatively little reference to one of the key actors on the scene of seaward development -- the port authorities of the United States. I bring them up for one primary reason. By and large, port authorities are public agencies. By and large they are separate authorities. Authorities can be loosely described -- and someone may want to argue with me -- as a device to establish a public agency on a particular level that makes it as unresponsive to the democratic process as possible. While this may overstate the case, the comment is not without some relevance to the current conditions of life.

Therefore, somehow we have to face up to the issue of bringing port authorities more directly into the mainstream of the democratic process, and, if public participation is going to be part of that democratic process, to find mechanisms under which port authorities (and this applies to some but not all) develop greater sensitivities to the public participatory process. Port authorities or port facilities are by and large located in urban communities. They are very important elements in those urban communities, and when in fact, as has happened in many cities, those elements go to rack and ruin through disuse or declining economic usefulness, this has a ripple effect that adversely impacts the fabric of the entire urban community. The port cannot be looked upon as an autonomous and isolated segment of its urban environment.

GENERAL DISCUSSION

ALFRED A. H. KEIL: I thought we should start with a request to raise questions, make comments, try to criticize or supplement some of the discussion or some of the summaries you have heard, not so much the individual cases, but the topics that were brought out.

SHEPARD PERRIN, Panelist, Loop Case Study: I am the Executive Director of the Louisiana Offshore Terminal Authority. My comment, Dr. Keil, came about because of the remark you made about "the act" being the Deepwater Port Act of 1974, passed by the U.S. Congress. There was such an act. The State of Louisiana had its own act, and there would have been no need for a federal act if we could have located the port within the 3-mile limit. There is a location within the 3 mile limit however, the base is mainly mud, and it would not sustain the facilities. So consequently, it had to be located outside the 3-mile limit.

We wanted an act just for the State of Louisiana. But as I mentioned in the panel yesterday, Texas wanted to get into the act, so to speak. So did Alabama and Mississippi, and there was a potential port on the east coast, so that created the need for a federal act, not conflict.

ROSS VINCENT, Ecology Center of Louisiana: I would like to raise a couple of points. Both of them I guess are actually triggered by something Mr. Brooks said. He made the point that we need to decide whether public participation programs are to be viewed as a means to an end or as an end in themselves. I think it is important to understand that people in government agencies who have to try to design these programs almost have to view them in that way. The vast majority of the people who are going to be part of these programs, the people that I have to work with on a day-to-day basis, don't view these programs either as a means or an end. They view them as a right. They all took high school civics, and they were taught in those high school civics courses that they were the ultimate decision-makers in this country, that the institutions, the government and industrial institutions, were supposed to be responsive to their needs. When they see themselves confronted with a major institutional decision that affects their day-to-day existence, they see their direct participation in that decision as a right. That is an important thing for people trying to design these programs to understand.

But it raises another question, too, and it is one that concerns me. I sense it as sort of an underlying tone here, and it is clearly a problem with a lot of people who work on a day-to-day basis in decision-making processes in administrative agencies. Because of the nature of the framework within which we operate and they operate, it is easy to begin to view the major decisions that are made as essentially technical decisions, and they are not; they are political decisions.

They involve all sorts of things that can't be quantified, that don't lend themselves to the kind of logic that tends to be applied in a lot of these decision-making processes. They involve people's aspirations for the future, they involve their perception of what the future in their communities ought to be like. In some cases, they have no bearing whatsoever on their perception of the national interest. People are going to continue to see their right to participate in decisions that affect their future in that light. It is critically important that the decision makers and the people involved in public participation programs understand that and accept it, because in the final analysis, what appears to be the best decision on the basis of the data may not be the proper decision.

NORMAN LEAMS, Interior Department: I was very interested in Mr. Brooks' observation that many times there is a considerable discrepancy between the resources that are available to public interest groups and those that are available to the developer, and his further observation that it may be appropriate for the developer or the protagonist to rectify this imbalance.

I would like some response from the panelists as to the advisabilty or the feasibility of dealing with this problem.

BROOKS: In the case of hazardous substances which may be dealt with within the framework of seaward development -- for example, an existing or proposed LNG terminal -- I would personally argue for making it mandatory that the developer contribute a fund of X-amount of dollars which has to be used in a no-strings way to somehow create a competence among impacted residents nearby. This should be both a competence in articulation and in the understanding of technical problems. I am not sure I would be prepared to go so far as to say that this ought to apply to all types of development, but I think in the case of hazardous substances there are pressures, there are fears, both justified and unjustified, which somehow have to be ameliorated. I think this justifies some very special efforts to do so.

KASH: I would make one comment on that. I share the general drive of your comments, but I think they are tied up with a point Jack Flipse made earlier. He said that the evolution of the manganese nodule development had resulted in a level of understanding and a substantive debate between environmentalists, the industry, and government.

A key element in that process is having people representing different interests who can talk about the substance of the activity. I can think of two instances in which people who were tied up with the states or environmental interest groups over a period of time became at least fairly knowledgeable about the activities. As they became knowledgeable, the tenor of the debate changed to a debate over about how to do it, about making it safe, about adequate numbers of inspections.

I just had a discussion in which some people were proposing that they

would oppose some activities the USGS was involved in. I was really amazed at the position that these people took, which was one of adamant opposition. After a period of time it became clear that there was very little understanding of the technical or substantive side of this; but the discussion got very intersting when they brought in an expert in whom they had confidence, and who was understandable to them. They were perfectly willing to change the debate to one on the details.

Some colleagues and I wrote a book some years ago on OCS development. An attorney with one of the environmental interest groups came up to me one time and said, "Do you know that you are responsible for our not taking the Department of Interior to court to block a lease sale?" I said, "Why, no. I feel good about that. Was it the power of the argument, the insight of the analysis, the logic?" He said, "Oh, no, nothing of that kind. We read your description of a down-hole safety valve." I said, "My God, that is the industry's description." "But," he said, "we believe you."

That is a fairly important point, and it is one reason for having someone who is technically competent in every camp. That is a key element in this process, and if you are going to deal with it, probably some kind of support that allows you to pay for that competence is necessary.

FLIPSE: May I add that that fund is available, and collected, painfully, from everyone regularly? The highlight is April 15th. That is where the money should come from.

KASH: That is why I say I am not sure that I agree with his characterization of where it ought to come from.

KEIL: I had mentioned yesterday the Georges Bank study which, by the way, had an impact at the time it was generated. It took us just as long to organize the funding for the study as it did to carry out the study. To get the money we were tempted to go to the protagonist for offshore oil development. We decided not to do that, because if we had, the study would not have been credible. We felt that it was better, therefore, to scrounge around and see where we could find it. Some came from the State of Massachusetts, some came from the New England Regional Council, and the Sea Grant program contributed the other third. It did, in essence, provide some information which then could be used by a broad spectrum to discuss the situation.

MASSE: I would like to try to make two points at once. One is to illustrate what is written into the Deepwater Ports Act, and the other concerns what exists elsewhere today. The applicant for a deepwater port pays for the cost of the application. To show that he is in earnest with the application he presents a $100,000 check. The major item that it pays for is the environmental impact statement. And not only that, but the application itself has something called environmental assessment that is used to build the EIS. That is the Deepwater Ports

Act.

But there is a requirement for an EIS -- and perhaps there are people from EPA who are more familiar with that than I am -- on any project that involves the federal government. It is my understanding that this is the technical focus of the project, explaining to everyone what is going on, the basis for the technical arguments. This is also the focal point, in the case of LOOP, of the public hearings. The draft environmental impact statement went down to Freeport and to New Orleans. We put it out, and then 30 days later we had a hearing. We said this is what we see as the impacts.

Let me add that perhaps during the writing of the EIS is when we should make sure that all the inputs are aired.

BROOKS: I disagree with that point, because often this public participation can be most valuable at the pre-application stage. The environmental impact statement assumes that an application has already been filed, that a project has been defined, and at this point you may have the hardening of positions, which will make life much more difficult. What I am looking at particularly is the pre-application stage, where a great deal of candid dialogue and trade-offs can take place.

LEONARD MEEKER, Center For Law and Social Policy: I have just one further word on the financing of public participation. Not very much has been done about this yet. There are some opportunities which are highly available. One is in the form of regulations, which a few government agencies have adopted: NOAA is among them, the Department of Transportation on a trial basis, the Federal Power Commission, as it then was, and now the Federal Energy Regulatory Commission.

Under those agency regulations, agencies have undertaken to provide financing specifically to public citizens groups for the purpose of enabling them to present their point of view, paying for their experts, and being a part of the agency deliberation process. I think this is a model which might be followed much more widely, and perhaps it will be in the future. If this Forum is to have some conclusions and some suggestions for the future, something in this area would certainly be appropriate.

There has also been before the Congress some legislation sponsored by Senator Kennedy and Senator Mathias that would do exactly the same thing on a government-wide basis. It would provide for public financing of public participation in agency proceedings, and also in any court litigation that might come on afterward. That bill hasn't gotten very far in the Congress, and I think this points up the difficulty of making use of the public treasury for this purpose. But it is an idea that is there and needs further attention.

I think I would agree with your implication, Mr. Chairman, that having the funding come from one of the interested parties such as an applicant for a license may be easier in some cases, and yet it may not contribute to the result that we would want to see in the end, which is

a very wide and firm public confidence in the result.

MIRIAM LEVERING, Ocean Education Project: Since 1972, I have had a little experience with public participation in regard to the Law of the Sea, a conference in which the manganese nodule problem is the major current stumbling block to an agreement that on other questions has really come a long way, considering all the difficulties there are in such a huge and complicated undertaking.

As a public person, I guess we were viewed with great suspicion and maybe resentment by everybody. Certainly the secretariat, the officials of the conference, didn't want to be nagged at by little public interest know-nothings, from their standpoint. Probably a great many of the developing world people were suspicious of us because we were the United States, and maybe we were in the pockets of somebody or other.

The companies certainly weren't interested in us because we were trying to make sure that the companies' interpretation of their own interest was not elided into the same thing as the interests of the global society, necessarily. But we finally found a technique of becoming more helpful, and that was to take some extremely technical and difficult, sticky issue in the conference, and to get together the best brains that we could find on the subject, with some of the delegates, many of whom feel somewhat inferior when confronted by enormous concentrations of brains and money. We simply would say this: "We have a list of questions here that relate to this topic, and we are going to run down these questions. Just say what comes into your mind. The report that we are going to put out isn't going to mention anybody's name, and it is just going to say that one participant thought so-and-so might be helpful in solution to the problem, and another participant might think such-and-such."

Well, the result of that is that we have relaxed everybody, and we have found that we have been able to come up with some good, helpful material. I suppose if it is true, as Jack Flipse has said, that expectations in the conference are down, which I hope is not true, maybe all of us have had some responsibility for that, certainly myself, and I think perhaps even the industry, for not taking a more problem-solving approach.

REPORT ON CITIZEN PARTICIPATION WORKSHOP

George W. Tressel, Leader
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The four case studies of this Forum vividly illustrate the problems of resource development in an increasingly confrontational environment. At the same time they display two sharply divergent views of the appropriate public role in this process.

Most of the Forum participants are directly involved in ocean resource development as decision makers -- as developers, technologists, investors, regulators, et cetera. Because of this, they reflect a deep commitment to continuing development. They have long since resolved to their own satisfaction the questions of whether this development is important, necessary, urgent, and desirable. Generally, if subtly, they regard the potential intrusion of emotional and poorly informed citizens as a threat to an orderly, rational, and necessary decision process.

In contrast to this view, many of the participants in the workshop on citizen participation view themselves as representatives of a fundamental public interest and right that is frequently ignored or treated in cavalier fashion. As such, they reflect a deep and growing division between the "two cultures" and a gnawing distrust of both the institutions and processes of decision-making. They do not tend to ask how resources can be developed or if the technology is adequate and economic. Rather, they tend to question the basic assumption that development is desirable at all, and with this to reject both authorities and the decision processes.

During the Forum these two viewpoints appeared as separate and almost unrelated discussions, addressing the same phenomenon from totally different value systems. Most of the case histories have presented the experience of developers who have faced the reality or potential of citizen participation as one of the problems of contemporary development. Very little was heard in these case histories from the citizen groups who are challenging and often obstructing such development. To this extent, the Forum is a subject of the same problem that it addressed, and it is appropriate to examine the views of the participants in the citizen workshop.

Citizen participation (and obstruction) are symptoms of a growing public disaffection and skepticism regarding all forms of authority and government decision-making. Again and again, public opinion polls emphasize that most decision makers are held in low regard. And while science and technology continue to enjoy comparatively high esteem, it is inevitable that they are tarred with the same brush when the

activities are sufficiently large to become part of the political arena. Topics such as recombinant DNA, nuclear power safety, and ocean resource development have reached this level of popular attention and will increasingly be subject to the needs of political rather than technical developments.

In earlier times such issues were treated as expert decisions, to be arrived at by knowledgeable elites within political parties and involved decision-making groups. Compromises, trade-offs and continuing disagreement on fundamental issues were accepted as part of the political process. But this is no longer true, and it is neither realistic nor effective to ignore the populist requirements of today's decision environment.

As Alex Morin noted in our workshop, case histories tend to divorce the phenomenon of public participation from its political and social context as though it were an unfortunate obstacle to development. Instead, we must recognize that citizen participation is part of a populist trend that is now generally accepted, not as a problem but as a right and an integral part of the decision process.

Complicating this picture is the growing trend toward single-issue interest groups that form and lobby in a constantly changing pattern that responds to the fluctuating array of public issues. The form and number of such groups has grown enormously, and their views are a social and political fact of life that must be solicited, addressed, and weighed as an integral part of the decision process.

They pose questions that are far deeper than the immediate issues of whether to build this platform or drill in this location. Instead, they tend to focus on more general questions: Shall we have nuclear power anywhere? Shall we harvest ocean oil at all? Such penetrating and categorical sentiments cannot simply be passed off as uninformed or obstructionist. The public is indeed uninformed and often does not understand either the reasons for development or the technical and economic ramifications. But like the shrewd old farmer who said "I ain't lost," the public is cautious, skeptical and not eager to be rushed. Increasingly, conflicting and confusing information, together with the ambiguities and consequences of technological development, force the public to rely on political judgments of whom they trust and whom they do not. It is not surprising that they are apprehensive.

James Turner pointed to one statement by an industry spokesman who sees the ocean development issues in terms of "industry, which wants to produce. . .faced by the public which wants to stop production. . .and the government which is trying to arbitrate these two interests." While there is some truth to this description, it is a gross distortion and simplification of the fundamental questions and problems. Rather, most citizen groups believe that they are forcing all of us to pay attention to the basic questions: What kind of a society shall we have? How much development shall we have? What kinds of trade-offs shall we make?

Because these questions are so penetrating and so general, and because they are so often poorly articulated and distorted by the terms of the immediate issue, they are easily rejected or disparaged by

technologists and decision makers are too biased and preoccupied to consider such basic questions. And there is a growing public determination to be consulted and make the basic decisions for itself. The need and the reality of this determination constitute the fundamental consideration which we must satisfy. The real questions are not what to do about public input, but rather how to solicit, respond to, consider and weigh such input in a way that seriously and convincingly implies the public's control of its own destiny.

Priscilla Newbury pointed to four factors that are necessary to such consideration and that citizen groups do not generally find adequately addressed.

1. Public Understanding. The public is poorly informed and there is little more than token effort to change this. Public "education" is usually a poorly disguised euphemism for public persuasion. As long as this is true, it is difficult to address the popular concerns, expect them to be well articulated, or to anticipate the instability that overnight turns a benign public to an attentive public and to a mobilized public.

It is certainly possible to provide better, more reliable, more basic and balanced information at every level of understanding. And it should be possible to do this in an early and open manner that implies that the public is a partner in the use of its own environment. But too often, government, industry, scientists, and developers feel that it is their right and privilege (if not moral duty) to enlighten and persuade the public to the "truth" rather than to provide balanced, understandable information so that the public can reach its own conclusions. We need greater recognition of the need for public understanding and the societal responsibility for balanced, objective, and accurate information.

2. Opportunity for participation. We have not yet developed adequate procedures for soliciting and airing public concerns and opinions. Furthermore, since public interest in such issues develops over a period of time, there is a need for both early and continuing participation as development plans mature. We have yet to develop adequate and consistent procedures to do this.

3. Public confidence. We live in an atmosphere of public skepticism. Unless the public feels that its views are seriously desired, considered, and incorporated into the ultimate decisions, it will continue to regard hearings and public meetings with doubt and hostility. In an environment of single interest politics, some views are intransigent and the sincerity of decision makers is inevitably tried and tested at length. We must be prepared to accept the fact that processes and decisions that were once issues for private and technical resolution are now dedicated to the public and political arena.

4. Appeal procedures. Both developers and citizens groups feel that the public "does not understand." Until we have established a more credible hierarchy of consideration and appeal, until both developers and citizen groups feel that their positions have been adequately

aired, understood, and weighed by the public, we will continue to face routine recourse to confrontation and the courts. This is an increasingly hostile and litigous society, but it is not clear that all such issues must be appealed in this manner.

In sum, these four suggestions reflect a need for procedures that will more effectively incorporate public participation in the decision process, so that it can be more constructive than adversary. As Lois Sharpe emphasized, such a constructive environment cannot exist unless there is a background of agreement on a common body of knowledge and "facts," together with a mutual understanding of the value systems that underline competing views. And we are led again to the need for greater public "understanding."

But it is not clear that this is enough. Paul Turner pointed to the costs of confrontation and noted that the real issues are not whether there should be citizen participation, but how there should be citizen participation, who should represent the public interest, and what is an acceptable response to diametrically opposite views. Is it possible to accommodate conflicting value systems in a manner that will ever be acceptable to both? Perhaps resolution of conflict with all of the attendant cost to society is an inevitable fact of our time.

We have not yet resolved the conflicts and failings of elitist versus populist decision processes, and today the pendulum is still swinging toward the latter. It is so because there have been repeated demonstrations that spectacular technology is not always accompanied by spectacular judgment; the quest for profit is not always in the public interest; and major developments can generate major disasters. These are fundamental attributes of a technological society and not all of us are prepared to accept them until there has been a penetrating debate and a new consensus on who shall do what, and with which, and to whom. Until there is some such consensus and better procedures to reach it, we must expect to continue the costs of confrontation and litigation.

It is unfortunate that this and similar meetings tend to focus on the intrusion of citizen groups rather than on how to overcome their weaknesses and incorporate their perspectives. Most activist groups are not simply uninformed intruders. More often than not they are generated by members of the science community who have exercised an informed and appropriate whistle blowing role when they felt that the system has ignored major issues. The more effective and persuasive of such advocates gather around themselves a group of disciples, perhaps less well-informed, and undertake an appeal to the public, which becomes a single interest lobby and results in the confrontations that have been described in so much of this Forum.

The public, to which they appeal, is generally benign and poorly informed, but there is within it a portion that has been termed the "attentive public" and to some extent serves as the gatekeepers of public participation. If the particular issue is of sufficient personal appeal and consequence, there is a flow from the benign general public to the attentive public, and thence to the mobilized group, which may

ultimately wield enough power to frustrate a President or a utility.

The process is unstable and costly to all involved, but it is necessary. Its dependence on appeal to the courts and a largely uninformed populace implies a rejection of representative government that is incongruous with the complexity of our society. But the failures of technology are sufficiently numerous to support the rituals that examine the needs and hazards and societal goals of major developments. Should they be so costly, cumbersome, and marginally effective?

A significant number of government agencies are attempting to develop institutions that will consistently incorporate public views as part of the decision process. NEPA and the various consumer representation offices, the information transfer activities of the Office of Biological Services at the Fish and Wildlife Service, and the Science for Citizens Program of the National Science Foundation are all part of this effort. But the need for and adequacy of such mechanisms has yet to be widely accepted by either industry, government, or citizen advocates.

We still face an imbalance where industry and federal agencies can devote millions of technical man-hours and millions of dollars to develop and marshal technical information in opposition to citizen groups that depend upon volunteer help and public domain statistics. Right or wrong, how reasonable is it to expect an individual, whether university professor, banker, or housewife, to make a significant penetrating case against such preponderant resources? In an environment where a major industry can simply buy most of the aerial surveys of Alaska, and thus remove them from the public domain, how democratic is the subsequent debate?

Stuart Langton focused on this basic issue. The American electorate is increasingly disillusioned with the representative process and increasingly cynical about government decisions. As the level of participation and representation erodes, so does the level of confidence in the results and the willingness to accept the consequences. Participation in elections has continued to decline. The number of people who participate in political parties is dropping. The power of political parties as consensus-building institutions is eroding. All are occurring in a period characterized by rapid social change and complex technological decisions. We face an overload of issues without mechanisms to meet the challenge.

Both developers and activist groups have resorted to obstruction and the courts, with all of the costs and doubtful results that this implies. In such procedures there is no assurance that results will represent the public interest rather than some temporal and arbitrary balance of power. And whether the results are accepted by any particular group is simply a question of whether they have won the particular issue. Further complicating this issue we have not yet agreed on who is entitled to represent the "public interest." Industry would not relinquish this claim, government claims the role and constituency, and most special interest groups are self-appointed guardians of this holy grail.

Perhaps we must continue to see the waste of confrontation and the legal model before all of the participating institutions will come to agree that winning a single issue is less important than an orderly and consistent process of decision. Perhaps we must experience both the problems of inadequate technology and the results of excessive technical zeal before the general public can appreciate and reconcile the issues of resource development.

These are decisions that rightly belong to the public. The questions of whether we shall radically change parts of our environment, and whether we shall undertake risks of vast (if improbable) consequence are too important to be decided without public debate and assent. And the fact that the issues are technical, difficult to articulate, and posed in a series of local confrontations over seemingly local developments does not alter this.

It is not easy to provide an enlightened public that is able to understand and weigh such far-reaching issues. So far the mechanisms for ensuring public participation in the decision processes have proven disruptive, delaying, and costly. The mechanisms that do not incorporate public views have produced Three Mile Island, a million dollar hole in the ground at Bodega Bay, and Torrey Canyon. So it is clear that we need a better process to provide public debate and assent, if not approval.

But our efforts at developing such mechanisms are very preliminary, and our efforts at public education have been minimal at best. We need more such conferences, and they should be directed toward the questions of public education and of public influence on the decision process. How can we assure that the public has participated in and assented to the principal lines of future development?

Most of these issues are not simply questions of sophistication. They are questions of value systems, which are not easily answered at any level of technical knowledge. In sum, this Forum, like the cases it dealt with, points to the need for continued debate addressed more directly to the political arena and to the decision process.

GENERAL DISCUSSION

KEIL: There is a strong national need for seaward development. It hasn't been stated that clearly and that concisely by the Executive Branch. This is one of the dilemmas which you have in looking at the various parts of the federal government, and dealing with individual pieces: there is no central thrust which says we should positively think about these developments. There also is a certain national posture which we envision for the United States, and for the United States versus the rest of the world, and in that context we must decide what we want to do. The cases studied in this Forum are illustrations of how cumbersome steps toward actual seaward development can be in the United States. I think there is no doubt about it.

We now are in a competitive world. We are not in the era of 1948, where we were the technical leaders and the rest of the world was

struggling, whether they were the developing or the developed nations. We now are in a world where we are seeing intense developments in other countries and an upward, positive movement of industrial developments. All too often we see in our country a beginning stagnation in various areas for all kinds of reasons. The dollar is losing value, et cetera.

In Norway, Great Britain, France, the Netherlands, Japan and a growing list of other countries we see a commitment by individuals and governments toward the development of ocean uses. And not only a commitment, but also an intensity of pursuit which is of an unusually high degree. This is the framework in which we must look at U.S. developments, realizing that the capabilities we develop as we move toward seaward development are valuable on the international market. This is what the other countries have recognized, and they are doing it.

With respect to industrial project developments and technology developments, there is another interesting dimension. I would like to refer you back to a comment which Russ O'Neill made about engineering, which I have translated into slightly different words. It is that the engineer used to deal with overcoming the technical constraints in developing a technical solution. He must continue to do that, because if he doesn't continue to do that, it won't work. But he also must now, in today's environment, make the solution work in the context of the societal constraints around him, and he has to learn to do that.

This is in essence the whole topic of public participation which we are discussing. We must look at it not only from the standpoint of the local interest with respect to the benefits derived to the local community from a port, but we must also look at it from the standpoint of the national interest. That was a plea in several of the cases when they were discussed. Who is speaking up for the national interest? If we ask the federal government, no one speaks up on it. I think that is a very sad comment.

CONRAD G. WELLING: I have been involved in oceans research and development for thirty years, ten in the military and twenty years in civilian industry. But I often look at the development and the tremendous amount of R&D going into ocean mining as just a step. Mining the manganese nodules offers an opportunity whereby we can develop the technology of economically mining the deep ocean floor, that is, 15,000 feet deep. This would in fact open up new frontiers for this century and the next.

We also know from work that has been done that there is a possibility of massive sulfide deposits in the deep ocean floor. Once we can develop the technology of economically bringing material up from the deep new frontiers would be opened. We would then say it is worthwhile to do further exploration, because once you have a technique for doing something, then you have an incentive to continue that work.

I think this has been brought home to us by the space program. The real value of the space program is not necessarily going to the moon. It was the path by which we have achieved advanced technology, particularly in communications, particularly in the microcircuits and so

forth. If the government is not going to open this frontier because of political reasons, we certainly need an environment by which industry can go ahead and develop a resource that will, again, have many unknown pay-offs in the future. The technology now is available to broaden our ability to exploit the deep ocean, which represents a tremendous surface area of the earth.

B. H. BRITTIN: Let me make two observations. One has to do with the basic question of public participation and trying to find common grounds between different kinds of issues.

I am inclined to think that it is almost impossible to arrive at common grounds. For fifteen years, in my personal experience, there has been a debate about Georges Bank. I think the fundamental reason for that debate is not because they ought to drill for oil there, or because there were foreign fishermen there at one time, but basically because the State of Massachsuetts is strongly inclined to try to get title of Georges Bank vis-a-vis the United States government. I haven't had the benefit of reading the research paper from MIT, but I suspect that it would be found that over these past fifteen years, the public, in open debate on Georges Bank and what should happen there and what should not happen there, has been very present indeed.

It would seem to me that the question of where the Executive Branch of the government stands is simply this: There must be a point in time when a decision has to be made. We speak in terms of credibility or confidence in the Executive Branch, and I suspect part of the lack of confidence might well be in continuing to postpone decisions.

Jack Flipse mentioned it in regard to deep seabed mining. He and his group took all the necessary steps and did everything just about right. But still, he is not, and the industry is not, mining at this time. Factors other than public participation come in here. I wonder also when we do have increased public participation -- and very obviously that is the trend -- what are we doing to ourselves competitively? If Country A has an idea to do something on the oceans, and we have the same idea at the same time, the odds are that Country A is going to get to it and do something about it before ourselves. So I wonder whether or not a function of time is not important here, as well as distinguishing between various issues, many of which are local in character. I don't think you can find too many common grounds.

MILTON JOHNSON, National Oceanic and Atmospheric Administration: I am certainly impressed with the way the citizen interest is evolving here, and how we are increasing the tempo of citizen participation. I wanted to emphasize, though, one element of this which I haven't heard much talk about. I believe that there are many ways that citizen participation can be increased through the work of professional societies. I happen to belong to the Marine Technology Society, and they not only encourage professionals to participate in their activities, but also citizens as well. Almost anybody could come in, depending on their interest.

I would also like to point out that one of these organizations, the American Oceanic Organization, just last spring here in Washington, with the cooperation of the Washington Waterfront Association, carried out a very successful citizen particiation activity known as Oceans Week. Many of you saw this wonderful outpouring of citizens during that week to learn more about ocean developments and what can be done out there in the great seas.

TRESSEL: There is a real need if you are ever going to have peace and quiet in the pursuit of these things, if you are ever going to have a government that has a policy of seaward development, to have popular approval of or at least sanction of it. This requires popular education.

Last year, for example, the National Sciences Foundation and NOAA had a project that had a lecture series on ocean resource development. On the West Coast they had a direct audience of 55,000 people, mostly blue-collar workers coming to listen to the pros and cons, and a remarkably technical discussion of it. So there is a real interest there. But it does take money, and it takes a substantial amount of commitment.

JAN SMUTNY-JONES: I would like to make a comment -- actually it is a note of caution -- regarding what is known as the national interest. We have gone through some very bleak historical situations in which decisions have been made in the national interest by some very talented, often brilliant and sometimes even well-meaning people. Some of these have been disasters.

In looking at energy development -- and certainly I am getting this feeling sitting here today -- any development regarding energy somehow is viewed as in the national interest. I seriously question that. We have been under the gun in California now for two and a half years that the SOHIO project has some overwhelming national interest. It has never been explained to us what that national interest is, by anybody.

So I would really caution against encouraging -- whether it is the Department of Transportation or the Department of Energy -- the establishment of a concept of national interest. It is very vague, and one that probably should only be used in times of war. It is actually that kind of issue.

DYER: I think that comment is a crucial one and that you will easily agree that the national government does not have a patent or the sole rights to making stupid decisions. Sometimes that happens, too, with citizens groups. I think what we are really dealing with are complex issues that neither the federal government nor the citizens groups can fully appreciate entirely at the outset, at the planning stage of a project.

Because we are not infallible on either side, or in any part of that triangle that was described a few days ago, we ought to be seeking mechanisms not so much for establishing positions that we will assert to

be right -- because I think we will fail in that process -- but rather to establish mechanisms that allow us to move forward, while at the same time allowing us to evaluate, or to accelerate, or to affirm, or stop, when in fact the evidence comes pouring in.

My perspective of the situation is that this is in fact what the Forum ought to be talking about: the mechanisms for proceeding in spite of the uncertainties. With all the scientific talent, with all the managerial talent, with all the citizens groups, with all the well-meaning people in this country -- and I think we are all well-meaning -- I think we are bound to make some mistakes, because we just don't understand well enough to predict our complex world.

JOSEPH GUSTAFERRO: I think it might be helpful to some of us in the government, since this Forum is being held in Washington, to have some discussion and perhaps evaluation of the mechanisms that the federal government has used in trying to get public participation. There are three or four that come to mind, I am sure, within the members of this audience and within the panel, and you could think of many more. When the President was first elected, as you recall, he enjoined citizens to write to the government and express their views on things. Although some of us were virtually innundated with entire schools that wrote letters to which we could not respond, this is a mechanism; whether or not it is a good one, I don't know.

Later on the Department of Energy and FEA and the Department of Interior and other departments have had a tremendous number of hearings, all of which are announced, and which the public is invited to attend and to participate in whatever decision is of importance. The Government Printing Office, the National Technological Service, and other publishing institutions within the government endeavor to put out a tremendous number of books, reports, and so forth, to inform the public as to what is going on.

EUGENE GRABBE: I would like to correct just one statement of our case leader, Jack Flipse, to the effect that Hawaii wants a manganese nodule plant. Headlines like that have appeared in our newsapers. However, I think we are in the position of Louisiana, of recognizing that the manganese nodule industry is an opportunity that may come to Hawaii once in a hundred years. So our approach has been to look at it and determine the benefits for Hawaii and the consequences. In the process of doing this over a number of years, I think we have created a climate in Hawaii that is receptive to the manganese nodule industry. I don't want anyone to go away with the impression that we are out selling ourselves.

One thing that occurs to me is that in the case of Louisiana and Hawaii there seems to have been a focal point for information dissemination, and we use that rather than education, because people don't like to be told they are being educated.

In our reports we always put in an executive summary which a thirteen-year-old can understand. By this mechanism we have succeeded

in obtaining state funding and support for our studies. But when I hear such terms as "uncertainties," "complexities," "credibility," and so forth concerning SOHIO and Georges Bank, I wonder if it would help to have a focal point which could be the center for study or dissemination of information. Through the use of universities, consultants and so forth, would such a center not have credibility and be recognized as the overall authority that looks at all pros and cons?

DYER: To some extent, and maybe to a large extent, we are observing a distrust in some of the institutions, particularly the established institutions in this country. One established institution is industry; another is government. Those who see in a proposed project the institutions at least describing it are somewhat distrustful.

I think your suggestion is to establish an institution or recognize an institution to serve the needs of the other groups that have interests in this project, who may be impacted adversely. My concern for that, quite frankly, quite directly, is that the moment one institutionalizes that process is the moment it becomes suspect. And I don't have a way out.

My own experience at MIT, for example, is that while we offered to do that, the moment we tried to institutionalize it is the moment that people begin to wonder about our motives in so doing. I tried to respond to your question by really putting another question before the group. It seems to me that the base issue is the mistrust in some of the institutions of the day, and that mistrust comes back to my point of a few moments ago. Namely, there is a general inability to predict precisely the outcomes of some of the projects that we are dealing with today. This is not a new phenomenon really, but we haven't been called before the bar of evaluation as frequently as we have in recent times.

I think we have to recognize that we do have that inability to predict, and if we do, perhaps there will again be some trust in our institutions. I am concerned with establishing institutions to serve the citizens groups.

WILLIAM AHERN: The panel here today illustrates a number of the themes that Professor Keil used. You mentioned a cumbersome process. Well, the need for public participation and different interests being represented is also being pushed. I frequently see these things being pushed simultaneously. This is the tenth anniversary of the Santa Barbara oil spill. Right after that, of course, for any coastal development in California, people would come out from every community to oppose either ugly things or damaging things being built on the coast. The people created an agency, which did just what Professor Dyer just said happens. They institutionalized the Coastal Commission, created it themselves, and then when the legislature made us a permanent state agency, the public participation has gone down precipitously with respect to coastal developments, because now there is an agency with a $10 million budget and a staff of 200 that has permanent authority, all of which is now part of Professor Keil's cumbersome process. However,

the successful public interest group is the one that gets an agency created with staff and millions of dollars, and then once it is created, there are inevitably some who have to watchdog that agency and don't trust it, because naturally a bureaucracy with all its political pressures doesn't do what the public who supported it expected it to do. That is exactly what is going on now, and it sounded like it came out in a number of these cases.

What I want to ask the case leaders is: A theme in all of these cases is the incredibly cumbersome processes. LOOP involved 21 Louisiana state agencies, and I don't know how many federal agencies. In the SOHIO project we saw the graphs of hundreds of permits required for these things from different agencies representing different special interests that used to be once-public interests, who managed to get an agency created to require a permit of anybody who wants to do anything. What I want to ask of the case team leaders is: In these cases, what public interests that you actually might call special interests were not represented in these proceedings by a government agency?

FLIPSE: I was impressed with the intellect and thoroughness of a public interest person, the "little old lady in tennis shoes," who lucidly made the point that small is beautiful and big is bad. When this subject came up today it was as poorly treated here as it was in our Forum session. Except for that intervention, all other discussion was institutionalized public opinion. The point was not pursued because of a strong acceptance of the national need for ocean mining.

KEIL: Was that really an answer to the question you asked or didn't you really mean the participation in the whole process over the years?

AHERN: I meant in the process. I understand there isn't a federal Deep Sea Mining Administration yet. I guess this hasn't been institutionalized all the way yet, but even now there seem to be a number of agencies involved. Yes, that was an answer.

DYER: May I respond briefly for the Georges Bank case? It is my impression that the interests and needs of the citizens of the area were well-represented by the various state agencies that became interested in the Georges Bank question. However, I would say that up until just recently my gut feeling is that a vote would have yielded a mistrust for the way in which that representation was carried forward. At the same time, however, there seems to be a growing trust in the way things are going. I think all along there was adequate representation; early on mistrustful, and later on, I am guessing, more trustful.

E. EDWARD BRUCE: Excuse me for making reference to some legal concepts, but I may be the only lawyer speaking here qua lawyer. There was a remark made by one of the members of the panel this morning that prompted some thoughts by me that might be of interest. It was observed that industry has from time to time gone to the courts to achieve its

ends. It would be naive to deny that. The present process of the so-called public interest law movement of using the courts for similiar purposes was compared to that.

Really, that got me to thinking about what is, I would think, the most sustained and important era in our history, when industry did what was described. This was a time in the beginning, about the turn of the century -- it had its heyday, I would say, in the early thirties -- when repeatedly industry or industry groups went to the courts urging such concepts as "freedom of contract," "substantive due process," and other similarly vague terms, in order to obtain the court's assistance which, by and large, industry got, in rolling back governmental programs, stopping them in their tracks and invalidating governmental programs that industry didn't like, programs that we now think of as progressive social legislation -- minimum wage, maximum hours, regulation of various forms of commerce.

Industry was able to do that because the dynamic of the judicial process is such that the people serving on the courts who respond to the arguments are ones whose education and background were shaped twenty or thirty years earlier than the issues that they finally adjudicate when they come to them. That is the nature of the federal and state judiciaries. They consisted in those days exclusively of men, and nowadays some women but not very many, who are in their fifties and sixties, reflecting their earlier training and outlooks.

Contrast that with what we call the "public interest law movement." There, too, you have a very organized group of highly sophisticated people who can utilize the legal system to obtain relief from it, not under constitutional concepts, but under concepts of "where lies the public interest," and other such concepts that are as vague as the freedom of contract doctrine, or the substantive due process doctrine that was articulated under the Constitution. And there, too, what you have is a forum for somebody who has one system of values that seems to conflict with the system or the set of results that a government process is spinning out, and is intent on using the judicial process to stop the governmental process.

I am reaching here for rather broad analogies, but I do it for a purpose, and that is to suggest the perhaps very fragile basis upon which this entire citizen participatory movement rests. The industrial effort that I have described was reversed in a few years when the Supreme Court's personnel was changed through the appointing power of Franklin Roosevelt, and when modern philosophy caught up with the members of the judiciary. The whole doctrine was abandoned, and it was just a total land shift in terms of the relationship between the judiciary and the legislature.

I am not predicting that that is going to happen tomorrow with respect to citizen participation, but I would suggest that if one gets to the bottom of the concepts that the judiciary is relying upon, and that in turn the citizen participatory effort has to rely upon, one will find that there are questions as to their doctrinal roots that are just as serious as those that underlay this earlier industrial effort.

RUSSELL WAYLAND: I will make a brief comment. I am coming up to a point that was made by Ira Dyer some time back when he was summarizing for his panel and pointed out that regulations are based two different ways: one is on the objectives to be achieved, and the other is on standards.

My observation is that whereas I agree with him, or I think I do, that the achieving-objectives way of writing regulations is probably the better, that is not the trend. Twenty years of looking at regulating changes in trends applicable to industry operations, where they have federal or Indian leases, shows me that increasingly we are putting standards into the regulations at low levels, and they get written up to higher levels, and to some degree they even get into legislation, so that we have a tendency to freeze regulations. This is part of our problem with not only using our own innovative technology, but it is another reason why I think other countries are free to do some things that we are not.

MEEKER: I would like to come back to Mr. Bruce's analogy for a moment because it is a provoking one. He was suggesting that when the nine old men in the twenties and thirties invalidated a good deal of state and sometimes federal legislation, they were essentially an anachronism, and that this anachronistic process is perhaps being repeated today in citizen participation and in the efforts of environmental organization.

I don't believe the analogy really holds. If you look back to the earlier period when constitutional attacks were being made on state and sometimes congressional legislation, those attacks were based on relatively novel theories about certain parts of the Constitution. I think it is quite true, as Mr. Bruce has indicated, that the attacks were successful because they did indeed appeal to a majority of the justices who had experience in private practice and as the counsel for rather large business interests.

Let's look for a moment, though, at what is involved in the environmental cases where public participation has been a feature. Here I think the situation is different, because what is happening is not that the public and citizen groups are asking the courts to overturn recent legislation which reflects the more modern perceptions about the way the society is best organized. That is not what is happening. I think what has really been happening is that the citizen groups have been coming to the courts and saying, "We and others persuaded Congress, and we persuaded some state legislatures, to enact some new legislation, giving effect to some ideas about the quality of living, which we and other people thought had some importance. The legislatures in question and the Congress did in fact enact those laws. Now what is happening is we are not satisfied with the way some of the governmental agencies are applying the laws in question. And we challenge this action not on the ground that some novel constitutional doctrine invalidates it, but because it is not faithful to the intent and the purpose of this very recent and up-to-date environmental legislation."

I don't really think the analogy holds.

FLIPSE: Not being a lawyer, I will try to do this very briefly. There are two or three other subtle points of law that were passed over, and I think it would be a mistake not to bring them out. Mr. Brittin put his thumb on the real Georges Bank issue, and since ocean mining of manganese nodules started before the Maine vs. U.S. decision, believe it or not, we actually negotiated with states who had never given to the federal government their right to develop the offshore area beyond three miles. Our legal advice was that we should negotiate with the state because we would be mining under state laws, but there was no chance, in terms of constitutional law, that Maine would be defeated. On the other hand, anyone who was close to Washington realized that although "the law" was in Maine's favor, the government court would rule otherwise, which happened.

I would like to respond to the unnamed lady who commented that the real issue of the Law of the Sea argument is the new economic order. It is not mining manganese nodules; it is the redistribution of wealth, the redressing of old injuries, so it is actually a superb analogy to the Georges Bank case and Maine vs. U.S. Anyone who thinks that the Law of the Sea debate on manganese nodule mining is a matter of the merit of the mining is as deceived as those who believe that the Georges Bank debate is oil versus fish.

POLICY ALTERNATIVES

INTRODUCTION

Alfred A. H. Keil
Co-Chairman

If we look at seaward development for the United States, the four cases chosen for the Forum have something in common. They especially show that the process toward actual development is long and slow. This is a common element that we must recognize and deal with as we talk about policy alternatives.

Now, to broaden our perspective, let's look at seaward development in other countries. For example, the development in Norway is particularly interesting, because ten or twelve years ago Norwegians had just begun to think about how to get to their oil fields. Now they have established a strong and aggressive offshore industry. They are building oil drilling rigs and selling them all over the world. They sold some to the Soviet Union. They also sell oil exploration ships, and they are eager to get even deeper into the international market with the technology they have developed in a period of twelve years.

If you look at Great Britain, there is similar development with respect to the North Sea oil. There is an emphasis on moving to the next step in offshore technology, going to deeper and deeper wells, deepsea completions, and corresponding support requirements. The U.K. Minister of Energy has indicated that by the late 1980's Britain clearly would have the tools the United States would need to go after its deep oil resources.

In France there is a Center for the Exploitation of the Oceans, which is systematically pushing the development of offshore oil, manganese nodules, and other resources. It is a federal agency; I don't know whether it has industrial sponsorship or not, but its goal is to establish a technological base on which the country can build its future strength.

As far as Japan is concerned, all of you are aware of how aggressive the Japanese developments are, not only with respect to the ocean, but

altogether.

These recent accomplishments and ongoing developments in ocean technology and ocean uses by foreign industrialized nations, as well as statements by their government and industrial leaders, illustrate not only the scope of their commitment to expand ocean uses and develop ocean technology, but also the intensity with which they are pursuing these goals.

Now, in discussing policy alternatives, we must look at the present pattern of United States development in the context of both the development in other countries and our own national aspirations and needs. Here, I think, we must include our desire for the kind of international role that we want to play in the long run. We can't play that role without having the necessary internal strength, industrially, economically, and otherwise. We must keep in mind the trade deficit, the shrinking dollar, and so forth.

In discussing policy alternatives, we must also realize that the pursuit of new seaward developments and related technology does more than accomplish the specific pursuit. These efforts also develop the base for new opportunities in the long run.

We must also keep in mind that we see a number of tendencies. I speak now not as the panel chairman, but as an individual. The branches of the executive part of the government tend more and more to act independently and with primary concern for their own prerogatives, while seaward developments cut across many departments and agencies. The states are also beginning to act more independently, and sometimes I personally have the feeling that together they act more like the United Nations than the United States. It is easy to say "Nyet, Nyet, Nyet," but in the end, we are all in it together as a country.

Last, but not least, I must say that I think that the Executive Branch has not really taken the leadership in the national issue of seaward development.

In the discussion of policy alternatives we must face the decision-making process itself, because that is at the heart of the whole operation -- the decision-making process by the industrial developer, the states, the federal government, and the various groups or individuals that participate.

E. C. BROUN, JR.

President
Petroleum Services Group
Dresser Industries, Incorporated

I am from Houston, Texas, and am with Dresser Industries, which is a multinational energy service company. I am a petroleum engineer, and have worked in the oil and gas energy production and service industry for some thirty years. I would like to point out that neither I myself nor my company owns or produces a drop of oil or a cubic foot of gas.

As we were instructed not to have a prepared statement, I don't have one, but I do have some observations from the last couple of days of the Forum. First, Mike Naess' triangle is really a quadrangle, with the three entities that he mentioned -- the federal government, the public, and industry -- now joined by state and local governments. We have certainly seen evidence of that in this Forum. There is LOOP, in which a project has come into being with all four members of the quadrangle participating; there is Seadock in Texas, which was not completed by industry, with the same four members of the quadrangle. There also is the SOHIO at Long Beach project. While I didn't attend the SOHIO discussion, I did pick up the project analysis, which involved a staggering number of state, county, and local agencies.

Second, Don Kash said that we have progressive levels of ignorance, and I have to agree with him. But there is one part I'd like to straighten out: The oil and gas production and energy service industry are educated. We have been educated the hard way in the past ten years. Politically we have been educated by the depletion allowance legislation; by the energy bill of 1976 and the recent energy bill of 1978, which extended price controls for gas production; by the OCS Lands Act Amendment, which furthered the regulations by which we are governed; and by the Corps of Engineers, the Coast Guard, the DOT and the EPA, OSHA, NOAA, and so forth.

And we have been educated environmentally. Two outstanding examples are the Alyeska pipeline, to which environmentalists added five years

and $7 billion in costs, and the Santa Ynez oil field in the Santa Barbara Channel, to which citizens of Santa Barbara added some eight to ten years and $4 billion in development costs. When you get those kinds of impacts, you get educated.

We know what can be done to industry by government and the environmental groups. But industry hasn't reciprocally educated the other entities. We haven't educated the government segments, the public, or the environmental groups. I have some examples of that.

I have had two experiences in public participation groups. One was the Industry Advisory Group of the Texas Legislative Committee on Oceanography, on which I served in 1970 and 1971. Most recently I served for two years on the Ocean Advisory Panel of the Office of Technology Assessment with Bill Menard and Don Kash, Director and Assistant Director of USGS, and David Bardine, Deputy Secretary of the Department of Energy in Charge of the Economic Regulatory Administration.

An example of our failure to educate these entities is the lack of impact of an assessment published from the work of the Ocean Advisory Panel. This assessment was issued by the Office of Technology Assessment in November 1976 on offshore oil and gas systems. It says: "Oil and natural gas can be produced in the amounts presently projected off the mid-Atlantic coast without significant damage to the environment or disruption of patterns of life in New Jersey or Delaware if operations are carefully designed, planned, and monitored." Despite this assessment, we have had to fight continued environmental opposition to this vitally needed resource development.

Another example of how we have not educated the public is the outcome of a survey of young adults across the country, ages 26 to 35. The survey was conducted by the National Center for Education Statistics of the U. S. Department of Health, Education and Welfare. Some of its findings astounded me. Only 20 to 39 percent of the young adults queried knew that the United States, with approximately 6 percent of the world's people, consumes 30 percent of the total energy consumed on earth in a year; that crude oil now provides the largest percentage of energy used in the United States; that from 30 to 60 percent of all the oil consumed in the United States is imported. Sixty percent of the young adults knew that during the decade 1960 to 1970, the rate of growth of oil use was greater than the rate of population growth.

In the part of the survey that requested input as to their preferences for energy sources, 66.4 percent of the respondents preferred large windmills; 59.3 percent preferred large solar energy collectors; 33.8 percent preferred dams with hydroelectric plants; and 21.1 percent preferred geothermal power plants. Oil and gas are not even on the list. Now, you would have to say that we have done a bad job of educating the younger segment of our society.

I am going to read you some statistical facts, published in Ocean Industry Magazine in January, 1976:

The energy produced by one 24-well platform with an average daily

> production of 12,000 barrels is equal to each of these sources of energy: one 1,000 megawatt nuclear plant of largest optimum size; 36 square miles of solar panels (that is, about two-thirds of the size of Washington, D. C.); 6,000 to 10,000 windmills (each about 100 feet in diameter); and about 80 percent of the output of the Hoover Dam.

That article goes on to say:

> If the United States hopes to achieve self-sufficiency in energy by the year 2000, we would need to find ten more Prudhoe Bays or four more states of Texas, and have them produce at full capacity. We would have to ban all new cars larger than 40 horsepower. We would have to force a 20 percent improvement in building heating systems; a 15 percent improvement in the energy efficiency by industry; a 15 percent improvement in the efficiency of converting electrical power; and we would have to develop all offshore oil and gas reserves as far out as the Outer Continental Shelves of both the east and west coasts; increase coal production 270 percent; convert all of California, Montana and Idaho to geothermal steam electric power; double the present rate of hydroelectric power generation; produce 2 million barrels a day of shale oil; and add one conventional nuclear power plant every three weeks from now to 1985. All that, just to meet the projected energy demands of this country by the year 2000.

I think those facts give us some pretty clear mandates. We had better stop debating and do something. We have heard a lot about the faults of our government, and it does have faults. I happen to think, though, that it is the best system and preferable to that of any other country in the world.

I think that in this educational process the government is the logical entity to serve as a focal point. Dr. Lyle St. Amant pointed of the LOOP came into being principally because they had 30 years of experience in making mistakes. But the people in that part of the country were willing to benefit by learning, and they were willing to communicate with one another in the quadrangle. I hope it doesn't take us that long to develop the Georges Bank and whatever other resources we have.

JAMES W. CURLIN

Deputy Assistant Secretary for Policy
Office of Ocean, Resource and
Scientific Policy Coordination
Department of Commerce

Having listened to Ned's litany of where we are and where we must go in terms of energy production, the most frightening thing to me, having attended Louisiana State University for training, was the prospect of having to create four states of Texas and of multiplying the number of Texans by four. There is nothing more awesome.

Let me share with you the experience that I have had for the last 18 months in dealing with what is called ocean policy. I think that we are talking in general about the policy process. In Dr. Keil's introduction, he pointed to the inefficiency in the execution of policy by the Executive Branch. We have just heard a plea from industry that we must get our act together in the Executive Branch and do a better job.

This ties in very well with the findings of a study that we have just completed at the Department of Commerce. We looked at the breadth and depth of "U.S. ocean policy," which is manifest in about 350 different provisions in the U.S. Code. Each of these provisions creates a function, requires a license, or provides an authority to impact the affairs of the public, industry, the economy, and the nation through governmental processes. This is the codification of our ocean policy. If one looks at ocean policy in terms of the laws that have evolved, which are the framework for governmental activities, you discover that most of the policy has been created within the past ten years. You also discover that the character of the laws that form this framework, which were largely the initiatives of the Congress, have been handed to the Executive Branch for implementation, with little enthusiasm from the Executive Branch itself. Furthermore, most of these statutes are essentially environmental and conservationist in nature, because they reflect that era in which we became very concerned about the things that were happening to the environment as a result of development.

To point that up, let's just tick through a few of these laws, beginning with the National Environmental Policy Act (NEPA) in 1969. This is the umbrella legislation with which we are all acquainted. The Coastal Zone Management Act is from the same era. The Federal Water Pollution Control Act Amendments, the Marine Mammal Protection Act, the Ports and Waterways Safety Act, the Ocean Dumping Act, the Fishery Conservation and Management Act, the Water Quality Act of 1977, the OCS Land Act Amendments -- invariably, these have some kind of resource allocation, environmental protection, or conservation theme embodied in them.

These laws were delivered to the Executive Branch for implementation. During that same period, there was either a reluctance because of budgetary limitations or a lack of will to structure the government to effectively implement these laws. So we find ourselves now substituting ad hoc measures, including public participation, to improve the decision process. There is little doubt that public participation must and will continue to play an important role in this entire area of public administration.

Each of the laws I mentioned was essentially single-purpose. Each of them approached a specific problem. And each dealt with actions on a case-by-case basis, just as we broke out the cases in this Forum. Each individual action is still treated as a single case.

Yet, what we are dealing with in this area of seaward development is a region that the United States has roped off, rightfully or wrongfully -- depending on where you are in terms of international perspectives -- the margin of the ocean around the coast of the United States, out to 200 miles with regard to fisheries. The OCS sometimes extends beyond that limit, and it sometimes falls short of it. But by international accord, we have control over those minerals on and in the seabed.

We of course still permit navigation rights on the surface under international law; but with regard to the management of resources, we have roped off and claimed for the United States through various means of essentially legal fictions an area equal to two-thirds of the entire 50 states of the United States. Two-thirds! However, we have established neither a management concept, a structural concept for government, a commitment, a goal, nor an objective for the utilization of these resources in a responsible way.

Why haven't we done this? The United States has established an integrated philosophy of management for other public resources. We have done it in the case of the national forestlands, the national resource lands administered by the Bureau of Land Management, and the national parks. But we have failed to establish a similar framework for the ocean area. I have chosen to focus on this discussion on the lack of capacity in the government to consider the ocean region as a whole in the context of seaward development.

No single agency, indeed, no agency at all, has the responsibility for looking at the actions and activities in that total region in terms of alternatives or futures of the resources, the national interest in developing those resources, the goals for developing them, or concern

for protecting the marine environment as a whole. We continue to do our business on a case-by-case basis, with little concern about how the SOHIO pipeline interacts with the development of Georges Bank on the other side of the United States.

In my view, we lack an adequate national focus with regard to the public resources of the ocean. We lack a national planning capability. We can easily co-opt future opportunities by the decisions made today through a lack of understanding of the implications of those decisions for the future.

Further, I have concluded, after going through the analysis of U.S. ocean policy, that although we have provided a framework for a national ocean protection and conservation program, until we match that with a national ocean developmental policy so that all of the players know the rules of the game -- so that industry knows how the game is being played and the public knows how it is being played vis-a-vis the objectives of government -- we have only "half-a-horse." Without a real policy, we will continue to have the confrontation that we see in the case-by-case, inch-by-inch, random-walk-through-life attitude with regard to the development and protection of ocean resources. Therefore, I suggest that we have to develop a national scheme to identify where we are going.

Where does that bring us? What is the integrating theme? I think we talk in terms of a concept that is well bred in public land administration -- that of balanced "resource management." Management has bad connotations as well as good ones. It is not a subversive scheme to take over and control the destiny of mankind. What it imparts to me, given my background, is this: One must identify the management objectives; analyze the best information available, including scientific, political and social; provide a framework for decisions and administrative processes; and provide for public input in a reasonable, rational scheme. I was under the impression that this is the role of government, but I find this notion to be somewhat of an abstraction, based on my current experience in the Executive Branch.

Thus, I think if there is a message that reads through, it is that we must begin treating our ocean resources like our public land resources. We have put the world on notice that we consider the ocean resources in the marginal ocean around the U.S. to be under our national stewardship. These resources being our responsibility, we have a significant stake in the ocean as a nation, and must not only protect these resources, but plan for their wisest possible use.

After sitting here for the last couple of days dealing with the specific cases of ocean use, I find myself reinforcing my earlier conclusions, but I see the problems even more clearly as a result of this Forum.

LEONARD C. MEEKER

Attorney at Law
Center for Law and Social Policy

I am a lawyer with a public interest law firm here in Washington, the Center for Law and Social Policy, which in fact was the group that represented the plaintiffs in the Alyeska pipeline case that Ned Broun has mentioned. We have also represented environmental organizations in various other matters.

The questions and the choices about seaward development of course involve some technical issues, and those are important. But the more fundamental issues -- and I think the ones that need to concern us most -- are the political decisions implicated in seaward development. They are decisions about the way we want to use our resources and the standard of living, the quality of life we want to have, and the kind of society.

We have seen from the cases discussed here yesterday that the answers to the political questions have differed a great deal. They have differed according to area. In the Gulf of Mexico, particularly in regard to the deepwater ports, resolving the political issues in oil and gas development has not been nearly so difficult as it was, for instance, in New England or California.

One feature of the current situation which seems central is that for the first time in U.S. history we are at a point where the resources are not so plentiful that we need not think about them a great deal. We do have to manage the resources that we control.

With respect to oil and gas there is a case of special urgency, simply because the supplies are not limitless and the prices of the imported commodities have gone up enormously. We have needs in the United States which are very substantial. What we do not have, and what I think contributes to the confusion and to the lack of rational comprehensive action, is a national energy plan, a plan which would tell us, after careful thought, how much energy the country is going to use

during a predictable period of time and where the sources of the energy are to be found. How much in the way of conservation is the country to undertake? How much in the way of new supply is to be opened up? Where is it coming from? I think the lack of such a plan, plus disagreement on the part of many different factions as to how to put one together, is a real problem for the country. Until a plan is elaborated, debated, and settled upon, subject of course to revision from time to time, we are going to have big problems.

Any plan needs to include a process for its implementation. We have heard already about the distrust of government, both federal and state. This is a reality. And in part, public participation is designed to cope with it.

I think public participation can also do some other things. It can contribute to an illumination of the impacts of particular decisions. An involved public can also insist on real scrutiny of what industry and the government are doing in a given area. Public participation can certainly serve groups who have views that they want to put forward.

Finally -- and this may even be most important function of public participation -- the process can be highly educational to the public, educational in the sense of bringing people to better understand the problems, the choices, and the facts and to know what the rational solutions are, given a choice of values, which I think do have to be established in a national policy.

Now, as I have said, I think oil and gas is a case of special urgency, which is not to say that we can relax in regard to other aspects of seaward development. Deepsea mining may seem less urgent today, but it ought not to be neglected. The deepwater port off Louisiana proved to be a relatively easy undertaking in terms of agreement among all factions. But that doesn't mean that problems concerning development of other deepwater ports are necessarily going to be disposed of so easily and with so much agreement.

As to seaward development in general, I think there are a whole series of questions that need to be asked. John Craven spoke enthusiastically in support of such development. I think before the country can accept his fundamental thesis, some questions need to be answered. They include the following: Suppose you do have co-location of different industrial activities for the sake of efficiency. Does this mean that marine industrial parks are going to be more energy-efficient and economic than they would be on land? Does it mean that they are going to be environmentally more acceptable? I think those questions haven't really been addressed. In fact, there needs to be a national study to try to produce some answers.

How do you undertake such a study? Well, some private studies have been done, very good ones, including the Ford Energy Policy Project. But good as it was, it hasn't given us a national energy policy. Congress conceivably could commission a study, take the results of it, and legislate a national policy. One wonders about the real likelihood of accomplishing that, simply because of the enormous difficulties and complexities of the legislative process.

My own belief is that the Executive Branch really has to take the initiative. It must appoint a commission and arrange for the Department of Energy to undertake a study. There are various mechanisms that could be employed. But we need to produce a study with some conclusions as to what seaward development is desirable, what its impacts would be, and then propose a course of action.

Now, to say that we should have a national policy on seaward development or a national energy policy doesn't mean an unchanging policy; it means establishing a basis on which action can be taken until further research indicates a different or modified course of action. In the process of producing policy, not only are all sorts of expertise needed, but also a lot of public input.

ERIC E. VAN LOON

Assistant Secretary of Environmental Affairs
Director, Coastal Zone Management Program
Commonwealth of Massachusetts

In addition to my position with the State of Massachusetts, I also wear what is sometimes regarded as the ominous hat of a lawyer. I was in the middle of the Georges Bank litigation representing the Commonwealth, and therefore on the opposite side from Mr. Bruce, who spoke to you earlier.

For the panel, I would like to briefly share three points of view: one on behalf of Massachusetts, to round out the record; another as a lawyer on legal history and the implications of it for citizen participation, because I do disagree with Ed Bruce's view; and finally, some overall thoughts on our primary issue of public participation.

First, a word in regard to Massachusetts and the Georges Bank litigation. While I don't want to dwell on this at length, I did hear the statement several times this morning that it was a profound misunderstanding not to realize that that controversy essentially concerned an attempt by one state to own, control, and dominate Georges Bank. I wish to report from my point of view that that is a profound misunderstanding, or at very best, an out-of-date analysis of the conflict. At no time during the public involvement, and also not in any of the very lengthy internal discussions that I participated in, was anything of that nature ever even hinted at.

Instead, the recent round of litigation activities has been focused primarily on the question that Jim Curlin posed a couple of moments ago. I share his feelings intensely. Looking toward ocean development, many in Massachusetts felt that a way was needed to bring together a coherent administration of the OCS Lands Act, the 200-mile fishing law, the Coastal Zone Management Law, and the Amendments to the OCS Lands Act which were then pending before Congress. This need, rather than any assertion of state ownership or control or takeover, was really the issue.

If such a thing as our national interest or national consensus exists

with regard to ocean development, perhaps the easiest way to define it is in terms of what Congress at any given point formulates as national policy. The situation in Massachusetts a year ago, when Lease Sale 42 for Georges Bank was proposed, was that the first substantial amendments in twenty years to the OCS Lands Act were before Congress. Previously, similar amendments had passed Congress, and the newest version contained environmental safeguards which, if adopted by Congress, would have applied to all future lease sales everywhere in the United States. Legally, it was clear that if the Georges Bank sale took place before the amendments became law, those safeguards could not apply retroactively to Georges Bank. For this reason, the thrust of the litigation was a holding or postponement action.

With those safeguards now passed by Congress, I think (at least from the viewpoint of the State of Massachusetts) that development will go forward. Presumably the new safeguards will be in place and spelled out. There are, of course, private environmentalist groups also involved in the litigation who have a different perspective; but from the state's point of view, orderly development was and is the objective.

Next, let me venture as an attorney to offer two thoughts on the role of the courts as they relate to public participation and seaward development. The first is that it is important to acknowledge the many instances in which the judicial arena has provided a constructive forum for public policy resolutions. The courts have provided the check and balance on executive and legislative action which, under the Constitution, they were intended to provide.

And I have often observed that courts have constituted a forum in which more dispassionate analysis and weighing of facts and issues has taken place than occurs in the sloganeering of the political process. In all too many political debates, representatives of different factions, trying to put their viewpoints across, seek shortcuts with slogans that will win them adherents. These generalizations don't necessarily advance the citizenry's understanding of the specifics. I think that happened, to some extent, with regard to Georges Bank.

I have a broader concern, however, about the suggestion made this morning that judicial involvement is something to be avoided if possible. I draw from the analogy of Roosevelt and the "nine old men" a different inference from the one suggested this morning. In my view the nine old men of Roosevelt's time can be characterized primarily as taking actions which rejected the national consensus that had been forged through the electoral system by Congress. Repeatedly, they ruled that the laws that the national consensus (as manifested by Congress) had adopted were improper, and in doing so they relied on old phrases like "freedom of contract."

To my mind, the court's role in OCS activity to date is the opposite of that. The courts are essentially reasserting the national will as indicated by Congress. It is the courts that are reminding us that there are new levels of environmental sensitivity, embodied in congressional acts. They are now saying there are new layers of citizen participation mandated through various laws passed by Congress.

Criticisms based upon catchword phrases such as the "national interest" are, to me, analogous to shorthand phrases such as "freedom of contract." I think the involvement of the courts in forcing the decisionmakers to look beyond such phrases and look at, adopt, and accept the national consensus legislated by Congress is a permanent part of the government landscape.

My third general thought is related more broadly to the idea of public participation and environmental sensitivity as we proceed with seaward development. It ties in with an idea expressed in the panels that one of our chief concerns has to be our international position and our comparative advantage vis-a-vis other countries. Implicit in this consideration is the worry that other countries may develop their seaward areas without the kind of public participation and environmental procedures that have been mandated by law in our country, and that therefore we are at a competitive disadvantage. The implication is that we should seek to minimize these pesky procedures which slow us down in our competition with other countries. In response to this concern, I wish to voice the reminder that our nation has repeatedly decided to impose such limitations, even if it put us at a competitive disadvantage with other societies, because we thought it was a more just and rational way in which to proceed. Our minimum wage laws and child labor laws are examples. Yet it is a price we feel is warranted.

I recall reading recently a quotation from a Brazilian government official who advocated the rapid development of the Amazon Basin and its wealth of minerals, even if that meant the destruction of several tribes which had long existed there. Development was to be given priority because the value of the minerals there was just too great for the government to take the time to consider what to do with those people.

In the United States, in contrast, I believe we have reached a national consensus that our decision-making at many phases must involve a greater level of public participation than heretofore. This public participation may range from court actions, citizens' groups, to, very importantly, the states and state and local officials.

Winston Churchill once remarked that democracy was the worst form of government ever conceived by man -- except for any other. By analogy, let me suggest that development of our seaward areas with time-consuming, sometimes frustrating public participation, with occasional intervention by the courts, and with equally time-consuming environmental procedures may be a most frustrating approach -- but nonetheless preferable to the alternatives. Our task should be to look not for ways to minimize these inconveniences, but instead to embrace them, to use them, and to get on with the job.

If we devoted the amount of resources to streamlining and making the process work that we sometimes do -- for example, in judicial actions -- in trying to justify the meager amounts of actual participation, I venture to suggest we might discover, in the long run, that we have shortened and enriched, rather than hampered, the progress of our efforts.

JAMES P. WALSH

Deputy Administrator
National Oceanic and Atmospheric
Administration
Department of Commerce

My name is Bud Walsh. I am both a lawyer and a bureaucrat, and I don't know what that makes me on this panel. In my previous position, as some of you may know, I worked for about six years in the United States Senate. I was at least partially responsible for some of the legislation that has come down the pike, including the Coastal Zone Management Act, the Fishery Conservation and Management Act, the Deepwater Port Act, and a good number of the pieces of legislation which I now have the unenviable position of trying to understand and implement.

In short, I find myself somewhat in the crucible of the debate over ocean policy, and unlike many people, have come into the ocean policy area trained in that area, previously at the University of Washington. All of my jobs have been in public service and they have all been related to the ocean. I have been in this area for about ten years now, and seem to have gotten somewhat stuck, as some of my friends who have gone elsewhere have said.

In terms of the themes that we have before us today -- seaward development and public participation -- I would like to be a little more realistic about the future and try to stay away from the traditional conclusion that people reach when they go through the process that you have: that democracy is pluralistic and complex, but better than everything else.

I think that the one main reality about seaward development, which will become even more evident in the future, is that the complexities of development activities in the ocean are simply not like those connected with land activity. The policy questions that come up are not like land questions.

First of all, most land in the United States has an owner, one who more or less owns it, under legal theory, from the center of the earth

to the top of the sky, unless it has been given to someone else. In the ocean the ownership is much different. The land under the water, of course, is owned, generally by a government. The water itself is not owned and not subject to control, except to the extent that access to it can be given according to regulations set by government. That is the tradition passed down to us from the King of England, and it makes the ocean very different in a legal sense from land itself.

There is an unusual public involvement in water activities. For navigation purposes the resources are owned by the public until access is provided to others. Fisheries do not belong to the fishermen, they belong to the public, and access is provided upon a fair basis as determined by our governmental systems.

Second, in the ocean we have unusual overlap of jurisdiction. Given that the United States has parceled itself up into a series of fairly complex government jurisdictions, on the land things have been fairly sorted out over several hundred years of activity. Over time we have developed a series of balances of political power between government institutions. For the ocean, however, that kind of activity and practice has never been fully developed, and this uncertainty breeds complexity.

Because of the unusual nature of the ocean, we also run into more of a debate about the proper role of government versus private enterprise. Of course, the United States is well known for carrying on and continuing this debate in every sector. In the oceans, I think it becomes even more pronounced because the ownership of the resources, of the seabed land, have a very heavy public tinge to them. So the Outer Continental Shelf is owned by the public and leased.

Now, there are some land analogies, but in one location in the ocean you can have far more kinds of conflicts than I think you will find in a similar area on land. In addition, because of the nature of water, the potential for one use affecting another use, even miles apart, is higher than on land. The closest analogy I can think of would be atmospheric and air pollution. But in the water there is an unusual interrelatedness between activities.

I think overlying the complexity of ocean development is the increasingly complex problem of achieving a consensus on our national goals and needs. We are a country that not too long ago talked about manifest destiny. We inherited resources that seemed without limit. We have now come to realize our limits and have gotten down to the much more complex and difficult questions of who gets what. And as our population increases, along with the rest of the population of the world, the demands on our resources are adding to the basic complexity of ocean activities.

What this means, I think, for the future is continuing difficulty in dealing with all our ocean policy questions. We have begun to operate under a series of statutes that try to guide public behavior. This legislation is only partly successful.

In approaching this complexity, I, for one, am quite skeptical about what is called planning. Planning is useful, but I tend to believe

something that has been well stated by Governor Jerry Brown: that if you don't know where you are going, government planning will get you there.

I think it is more important that we begin to analyze the basic process by which decisions are made. When I was in law school, one of the things that shocked me was a law professor who told us that the law cares more about fair process in many instances than a truly just decision. That, perhaps, is an overstatement. But it is important that the United States, unlike many countries, has been strongly concerned about the procedures by which decisions are made. If the process is fair, the outcome is likely to be more easily accepted.

In the future, I think we must accept that there will be strong and active government involvement that is likely to become as complex as the problems and the issues. Because of the interrelatedness of activities in the ocean, there will be a lot more pressure to control activities along the seaboard as we move seaward.

I do not see that we will truly resolve the debate between government's role and the role of private enterprise. It will continue to sway back and forth over time, and that complexity will add to our woes.

By and large, government does not anticipate problems; government reacts to a problem and tries to set forth a statute to change behavior. We didn't, for example, deal with fisheries very adequately in this country until we saw that they were being over-fished. We then created a mechanism to solve that problem, which in the eyes of many created more problems than existed before. One has to ask: If we had started conservation practices earlier, would we be without the complex management system we now have? Of course, now is too late.

We hear a lot today about the need for energy. In this Forum, we have talked a great deal about it. We can look back and say: If we hadn't had an import quota some time ago and had been using cheap foreign oil, today we would be far better off. Having experience, unlike many people, on both the congressional side and in the legal system and the government bureaucracy, I see substantial flaws in the way we reach decisions.

One of the things that I am growing concerned about is that we are tending more and more to divide ourselves into camps, and each camp sees all the weaknesses of the others but spends little time looking at its own. Each camp grows more doctrinaire, more insistent, and less worried about what is fair overall.

In my opinion if government -- because it must play a role -- is going to work, it is going to have to do a much better job of being an honest broker, of providing a system whereby decisions can be made among the many competing parties. We must not resort to influence to get into power and make these important public decisions. I think we have to be concerned about establishing a process to make sure that the best technical information, the most thorough analysis, and the best judgment are brought to bear upon our ocean and seaward development.

The complexity of our system, I think, is making it difficult to

arrive at decisions that truly are supported by everyone. More and more groups of people are finding that political mobilization along a narrow interest line is a very effective way to get a victory. But a narrow victory in the long run is not good. In this town there are many people who are beginning to think we can't allow the system to become so narrow, so special-interest oriented and fragmented, as to create a morass of fighting fiefdoms. When that happens, there are no decisions that are timely or fair or balanced.

I realize I am offering some high ideals without any practical recommendations. My feeling is that seaward development will take place and that there will be fights over it. I am very much concerned that there is not, presently, a process for getting people to sit down on a reasonable basis -- without shouting at each other or fighting in the courts -- and trying to work out a common approach. I find that particularly true in the bureaucracy, where people tend to owe their allegiance to their institutions rather than to a good decision.

I think one of the benefits of public participation is to make us all aware of the faults we have, not only as bureaucrats, but as people.

IRA DYER: I would like to return to the nature of the decision-making process, and the uncertainty that, at least in my view, often surrounds it.

One speaker characterized the encampments that occur during the decision-making period when the various groups retreat to their corners and invent slogans. It seems to me the reason we tend to do that is that we are facing in many instances complex environmental, market, technological, and political situations. And as individual decision makers, it is difficult for us to come forth with judgments, no matter how well-intentioned, that are perfect predictors of the future.

So it does seem to me that the basic problem we face is decision-making with uncertain outcomes, and we retreat to very hard and defined negotiating positions.

We might make some progress if we could be more creative and develop mechanisms for accommodating such uncertain outcomes, for making the respective parties feel somewhat comforted by the fact that the decisions are not ultimate and final ones and can be reviewed; that harm can be compensated; that projects can be accelerated or stabilized or terminated. And while this may sound too flexible to be comfortable, I think the uncertain nature demands a decision-making process that will accommodate to it and that that may in fact be a stabilizing feature.

I would like to have our experts on policy alternatives, especially from the government side -- who often need to say things in very sure terms -- say how they feel about decision-making with uncertain outcomes.

CURLIN: Do you include state government in there, Ira?

VAN LOON: Speaking from a state government point of view, I would

hope so. I find myself in substantial agreement with the thought that you have just expressed. I believe we are proceeding toward that mode of decision-making with the fallback position and that one concrete embodiment of this newer approach is found in the amendments to the OCS Lands Act which were just passed by Congress. For the first time with regard to seaward development, the amendments now provide clear legal authorization, for example, for the suspension or cancellation of leases, with compensation to the oil companies, in the event that some environmental disaster takes place. The amendments also provide for a second environmental impact statement to be done at some point after the exploratory stage is completed and before the development and production phase commences. I view both of these as mechanisms or opportunities to stop and reevaluate directions even though the basic process has begun. That opportunity did not exist before, and I think the recent amendments represent a step toward institutionalizing what you have suggested.

WALSH: How do I feel about decision-making with uncertain outcomes? Uncertain. Regulatory programs in this country have now been set with very tight constraints on the decision-maker. Not too long ago, you could get something like the original Outer Continental Shelf Lands Act, one with very broad authority. We were comfortable that the discretion that would be exercised would, in fact, be fair.

Today, whether you talk about OCS development or tanker safety or a wide range of very technical areas that we are trying to regulate in the public interest, these broad discretionary provisions are absent. In fact, because of the activist nature of both sides of the issue, statutes are getting more and more rigid and complex. And there is distrust. The distrust everybody talks about, at least in regard to the Executive Branch, is exhibited in what the Legislative Branch puts in statutes. Part of that is because, I think, the Legislative Branch does an abysmal job of oversight. Too much concern and thoroughness just doesn't get any attention politically, and it is hard work. Some people are afraid of what it might do, for instance, to the friendships that you need to get political results.

After a year or so, Congress will sit down and write very tight specifications in hopes that they will know exactly what the outcome will be. And I am concerned that may result in decisions that may be somewhat skewed, and that the fight to eliminate uncertainty may be as bad as anything else.

What I am most concerned about is that the system honestly make an assessment of the points of view. From my experience in Congress, most people are result-oriented. They want to figure out a way to get their point of view across. With the Deepwater Port Bill, I think, there was a fairly good process leading to the legislation. It was a good model of setting deadlines on the process and decision points along the way.

A key thing we did was to say, "Look, the state governments are going to play a role, like it or not." Everybody accepted that fact, including the oil industry, and they felt very comfortable with the state having a veto power.

I then got involved in liquefied natural gas, and we thought because of the siting complexity it would be a good idea to have a one-stop system of permits. We recognized one agency in the federal government, we would have a timeline for making decisions, and the governor would have a veto. At that point the liquefied natural gas industries got off the bandwagon because they were afraid of the outcome. We offered them certainty and a decision point, but they didn't want to deal with it.

You see that kind of frustration occurring where people want more certainty out of the situation than there is. In many cases, it is best to just live with the uncertainty, to try to get a full evaluation of the technical, legal, and social aspects, get a decision made, and then get on with it.

Unfortunately, everybody is trying to remove uncertainty in their favor, and it has led to a real slowdown, I think, of the regulatory and legislative system.

CURLIN: Under the surface of the process that we have focused on is a parallel process, that is, the decisional process within and among the government agencies and departments themselves. This process involves every bit of the conflict, passion, and vehemence that is in the case-by-case public participation process. And to the extent that public interest vis-a-vis the various interests and concerns is reflected, the decisional process within the government itself is another dimension of the public process. Each of the agencies reflects the attitudes of its constituents. They are as real as the groups that express themselves in the public hearings.

These debates are sometimes rather dramatic and sometimes low key. Harnessing the special concerns within the whole equation is a problem, and I think that process is what we must work to improve.

With regard to managing the uncertainties, I hope I am interpreting you right that the ones to which you refer relate to dealing with the "project" rather than the "decision." I believe the thing that we owe to any entrepreneur who is putting the money out front is an orderly decision process that has an element of finality.

Eric mentioned the new provisions in the OCS Lands Act as an example. I don't know how the National Ocean Industries Association would respond to this, but I see that as being a management process. At the least, they should know how the rules are to be played. Once the rules are known, the private sector can "discount" them and live with them. They may not like the outcome, but they can live with the result.

The Deepwater Ports Act is another good example. It is progressive legislation to the extent that it provides a timeline and provides input at specific points. It seems to have worked in at least one instance, and we hope in the second instance, and maybe the third and fourth, as needed.

In other cases, however, we must depend on the initiatives of industry to identify opportunities. They come forward with a proposal in the framework of the license, leasing, or permitting systems. It is at that point that the government decides that theirs is an

ill-conceived idea that is not in the public's best interest.

Unfortunately, industry isn't able to operate as openly as the government. We had to forego some of the best case-candidates for this Forum. These include the two refinery proposals pending right now. In general, there is a consensus that we need more refinery capacity in the East. There are two locations: Pittston, Maine and the Hampton Roads/Portsmouth area, Chesapeake Bay.

When you build a refinery -- and I am not speaking as an expert on this, but from hearsay -- you do it low-key and under the table. One doesn't go in and say, "Hey, city fathers, we are going to put in a refinery, and we want to buy this land." You do it through brokers, you do it through agents, you do it quietly, because the landowner will jack up the price on you. You have competitive factors to protect. So this automatically puts it under a cloak of secrecy. The investment must be virtually nailed down before you can go forward with any of your permits and other approvals. You must have your studies in place before the fact. That is the point when this all comes down on the industry's head.

I believe that we must be sensitive to this as government officials when we are protecting the public interest, and I believe we can do this with a little inventiveness and creativity. But we also have to recognize the constraints that we place on the entrepreneur in putting the money out front. We are very sensitive, as Bud suggests, to the proper balance that must be struck between where the legitimate government role stops and the private sector begins. We have placed this responsibility largely on the private sector. We don't have a national oil company. We do dictate where these activities are not to be. We don't dictate where refineries are to be. We don't even dictate where oil and gas can be developed in the OCS, because those locations are nominated by the industry itself.

If we are going to place that responsibility on the industry, then I think we also have a responsibility to see that the decision process is timely and orderly.

I believe that out of this system of uncertain decisions must come a decision process, and one that has certainty, with explicit rules for the game which all the players understand.

DYER: I think you have discussed two issues. I was thinking less of uncertain decision-making and more of decision-making for processes that had uncertain outcomes. I couldn't agree more that our society at large -- not only industry, but everybody -- needs to have an idea of how the decisions are to be made and needs timelines. We ought to be disciplined about it.

But I was really addressing those physical, social, and environmental phenomena that by their very nature will turn out, under the best of efforts, to have unpredictable outcomes. And yet we have a need for the entire society, on one hand, to keep moving forward with industrial development, and on the other hand to do it so that individuals with other interests are not harmed. If we attempt to wait until we

understand everything before moving, my dire concern is that we will harm society by waiting too long.

WALSH: That is a real dilemma. If you look at the history of regulatory activity, if you read some of the court decisions that were reached whenever there was a pollution case, you will see that at the time of the Industrial Revolution the custom was to not put any constraints on the activities of private corporations. The private corporations of this country were the principal social instruments through which we achieved national goals.

But what happened is that there were some people who did overreach. There were those that learned that if you owned the tank car as well as the oil you got everything there was to get. If you look at the railroad system and at the oil system, it led to the regulatory activities that you see in this country. They didn't just start overnight, and they weren't started to harrass business.

In the environmental area, you see a lot of regulatory activities. Take the toxic chemicals area, where we learned that when kepone has polluted a good part of the James River, it cannot be removed, that it is in fact dangerous to us as well as to animal life. Why didn't we have more controls before it got there? There is a series of cases that have come up where there have been no controls. There has been an abuse, a mistake, a risk taken and lost, and then the regulatory system has moved in.

The regulatory system has usually been, in this country, a reaction to a mistake. It is getting so that we are less willing to take risks in all kinds of activities. I think the euphoric philosophy of the scientific revolution is beginning to draw back to a more careful, cautious kind of philosophy. That means that we are going to require a burden of proof from the doer before he does. That has become something of an ethic, as exemplified by NEPA and many of the regulatory activities. But those changes were born of human mistakes. What that may mean philosophically is that there are inhibitions that ought not to be there, that we ought to accept that there are risks and that the worst thing we can do is stand still. I suppose history tells us that.

BROUN: Maybe I can reply to the comments about uncertainty from the standpoint of private industry.

First, we don't have the luxury of making decisions without answers. We have to get to the bottom line and to get there with profits for our stockholders, or we had better look for another job. So we have to make decisions that are finite and take risks.

If we are servicing or operating in an area in which we encounter constraints that prohibit us from operating profitably, then we shut that area down and go to another one. Dr. Keil mentioned the advances in the last ten years for seaward development in Norway, the U.K., France, Japan, and so forth. I might point out that those advances were made with U.S. technology. In effect, we developed the North Sea

because we weren't able to develop the Atlantic Seaboard. And we developed Indonesia and the Persian Gulf and a lot of other offshore areas. When the situation is such that we can operate competitively in an atmosphere that will enable us to make a profit, we will be there, and hopefully it will be in the United States, because that is where our interest lies.

On this matter of regulations and overreaching, I can assure you that those of us who have any sense at all and are patriotic are not going to be overreaching. I am also this year chairman of the National Ocean Industries Association. We have 380 companies, all associated with seaward development, all the way from two-boat outfits to great big shipyards and service companies. We are well aware of living within the constraints.

If we have an orderly decision process, if we have legislation like the OCS Lands Act Amendment, even if we don't agree with a lot of the points, those are the rules of the ballgame and we will play by them.

GEORGE TRESSEL, National Science Foundation: Mr. Broun made some comments about the government being the appropriate place for educating the public regarding such topics, and I would like to respond to that.

What we are looking for essentially is the technical/political equivalent of informed consent, and that means enough understanding for the public to be able to listen to a diagnosis, with the potential to reject the treatment. That does not have to be a very high level of sophistication, and it certainly is true that the government is the obvious focal point for this kind of awareness.

However, the government has a hard time dispensing information in a balanced, objective, and accurate manner, because in many cases government is also a participant, as it certainly is in seaward development. That is why the polls say that the public gives such low credibility to the government, along with industry and so on. They may not understand the arguments or the information, but they do understand that you have some motive for telling them about it.

Now, I believe that the government agency involved is the appropriate focal point for public education because it is the place most likely to understand what needs to be said. What is missing is a way for the agency to carry out this responsibility without an inherent conflict of interest. On the one hand, the agency can appropriately say, "Here, public, let us tell you about the prescription that we have for you and why we have it." What it cannot then do, on the other hand, is say, "Let me tell you, friend, how to evaluate this prescription." I could recite, as I am sure you can, a long list of occasions where the government has abused that and where agencies have, for example, sent pamphlets to California to help settle the nuclear initiative thing.

There is a solution, I think. That is for us to adopt a policy that each agency has a responsibility for both information, that is, for stating its own position, and education, that is, providing perspective in its own area. In giving information, it has the responsibility to go forth and inform the public about what it is doing. But education

should be done indirectly, through a process of providing funds to independent organizations -- say, for example, the League of Women Voters, universities, public broadcasting, there are many organizations interested in doing this. The government can provide grants, with a peer review process that precludes government from controlling the content.

We need ground rules -- and we have good precedents in my program, in NEA, NEH, and so on -- for providing this buffer between the federal role and the actual carrying out of information activities. First, we need to establish a principle that agencies have this dual educational responsibility.

MEEKER: I would like to suggest that the government agency should have a responsibility to provide for a very rational process of illumination of each case, and that it ought to get started on this at an early stage, with public participation from the beginning.

Now, Jim Curlin has suggested why it may not be feasible for industry to invite public participation from Day One. But I think as soon as a government agency begins to think about a project, it ought to make sure that there is public participation so that there will be a perfectly open and rational process of deliberation, with no thought that the government is trying to do anything in secret.

If the government does provide for an informed and rational deliberation, the uncertainties that Professor Dyer has talked about are likely to be reduced. To the extent that you bring to bear all the information, all the points of view, all the expertise available, you tend to reduce uncertainties. You also reduce another undesirable feature of some past cases: relatively desperate public participation that comes in at a late stage and tries, through appeals to statutory requirements and technicalities, to reverse a decision which ought to have been debated at the start.

So I think that government agencies certainly should arrange for a careful illumination of the problem, and then make their decisions in terms of what is brought out. It is also very helpful, as Professor Dyer suggested, to have not an irreversible decision, but one in which there is the possibility of some reconsideration. We should follow, perhaps, the deepwater port precedent -- which unhappily seems not to have been followed by liquefied natural gas -- rather than the pattern of the SOHIO case in California.

KEIL: Does anyone else want to respond to that question?

O'NEILL: We have talked about uncertainty, but I wonder about diversity. In our case it is not a question of an uncertain outcome; rather, it is that certain groups don't want that outcome, even if they know exactly what it is going to be.

KEIL: Are you referring to the SOHIO case, your specific case?

O'NEILL: No, Professor Dyer was talking about uncertainty, and I am just saying there is this question of diversity, that no matter how serious you are, people don't want certain outcomes. How do you deal with that?

MEEKER: I would like to come back to this question of basic policy decisions. It seems to me that there does need to be some national policy on energy that will at least suggest answers for a specific project.

It was brought out in the discussion of your case that when the California Coastal Commission asked the federal government whether, from the national point of view, the answer would be positive or negative, no answer was forthcoming.

The federal government, dealing with the national problem of energy availability, should be able to say to the state coastal commission, "We do not consider that this particular project is one which meets the series of goals that we have settled upon nationally," or, "It is one which in fact meets those goals". And if the federal government could honestly give its answer on that kind of issue, my guess is that the state authority would consider that along with other factors in order to produce its own decision and that it would not be parochial or irresponsible. But there does need to be some national energy policy-making, and I think we are suffering from the lack of it.

CURLIN: I feel compelled to introduce another dimension, and I guess this gets into "pluralism." If we have an energy policy, where does that put our environmental policy, because those trade-offs are fundamentally what we are dealing with. And if we have an ocean policy, where do environmental and energy policy fit in? "Policy" is the most popular word around this town. The quickest way to pull a "policyphile" up short is to ask that person what policy is, because it is impossible to define. We all know what policy is, but no one can define it.

I am not convinced that a mere statement of energy policy -- we have had many such statements -- will solve the problem.

MEEKER: It needs to include environmental factors.

CURLIN: Okay, so you are really talking about a comprehensive policy to treat a series of problems.

MEEKER: That is right.

CURLIN: Maybe we come closer to that in talking about ocean policy than anything else. But when you ask the government to make a decision, whom do you ask? It is not "Mr. President," obviously. He sits in a rarified atmosphere, and he has sixteen cordons of defense around him and can't speak to anyone unless they get past the keepers of the gate. Mr. Government? Congress? Five hundred and thirty-five Mr. Governments on the Hill? They have their own specific functions, so the focus on

administrative decisions is downtown.

We have agencies whose names impart some kind of meaning to their life. We have the Department of Energy, and many subdepartments of energy. One of the interesting things that happened as a result of the reorganization activities of this Administration and the creation of the Department of Energy was the elimination of the Energy Resources Council within the White House.

We have now created under the Department of Energy an Energy Coordinating Committee -- the ECC -- which has the same composition as the Energy Resources Council. Sitting on the ECC are about ten agencies and departments of the government. When a major decision is needed on "energy policy," one with the capacity to significantly affect many sectors of the public, it goes to the Energy Coordinating Council to resolve interagency differences. So in the case of an energy decision, you are addressing a multiplicity of interests. The anatomy of the decision process in the federal government reflects the divergent goals of society as a whole in dealing with these issues on a case-by-case basis.

What is the result? Well, a clear government commitment that one factor is more important than another can influence the decision, but I don't think this kind of determinism is what we are after. As Len suggests, when we talk about energy policy, we are talking about a total management policy that combines the social, economic, and environmental factors into one decisional process.

We are demanding a lot of the system, and I think implicit in some of Bud's opening statements was the suggestion that maybe we shouldn't expect as much as we are from this decision process. While we must continue to try to improve it, we should do so with an acknowledgement of the realities. When you ask the government for a decision, I fall back on my own understanding of what a government decision imparts. We have thus come full circuit. The decision reflects the same kinds of concerns that we talk about in terms of public participation, so we are back to "go."

WALSH: You forgot political policy, Jim, and I suspect that in the case of SOHIO and the silence of the federal government, that policy was predominant. If Jimmy Carter told the State of California what to do, the state would be unhappy and his chances of getting that electorate to vote for him in the next election would be much lower. I have found that to be true. Much as we say Let's have a national policy on energy, people in many of the states -- and this is the basis on which many state politicians, such as Dixy Lee Ray, are being elected -- don't care what the federal government says; they want to make their own decision, even if it is the wrong decision. There is a political risk to anybody going into the State of California and saying, "I am the President; we need the oil; build SOHIO." So we should never forget the politics.

MEEKER: That is not quite what is involved. California in that case has a decision to make of whether to say yes or no. It is not a matter

of the federal government coming in to make the final decision, but of its being asked for a viewpoint, an evaluation, which the state will take into account. I think it is helpful if the federal government has a notion of what the nation's energy needs are, how they can best be supplied, and how the environment can be protected, and communicates that to the state authority to use in making its own decision.

KEIL: The Coastal Zone Management Act requires that the state consider national priority. It doesn't say it has to comply with it. This is exactly what Len is saying.

WALSH: There is some debate on that point over whether the state must not only consider the national interest in energy facilities, but must actually site them within its boundaries. That is not a small argument.

KEIL: Let's go to another question.

TOM SHOREBIRD, Student: I wonder if the panel could discuss the state of the art of image analysis and how it applies to the decision process, and also if this level of information would be available to the citizen in the decision process, including some examples of that technology -- satellite imagery and animation and engineering animation, aircraft type, or traffic flows and things like that -- as well as base maps that Census has that might be applied to ocean data.

KEIL: Who wants to take that on?

WALSH: Let me comment that NOAA has a sizable satellite operation which we use principally for weather forecasting, and we are getting more and more into experimental activities. The LandSat satellite, which is under development by NASA, is expected to play a large role in refining basic information gathering techniques.

For example, we have used satellite imagery to identify the eddies of the Gulf Stream. That information is being used for all kinds of things, in particular for traffic routing and related activities. The government is also engaged in a fairly major analysis of space policy for the future. Particularly, how do we make better applications of satellites, which essentially began as a national security activity but have now begun to move more and more into providing data for day-to-day activities? Satellite data are being used in a variety of ways throughout both government and private enterprise. They will, of course, provide us better information about decision-making.

CURLIN: More important, perhaps is the translation of that information into something usable by the general public. Within an area that is equivalent to about two-thirds of the continental span of the United States, there is essentially no capacity to look at the resources in total context, and I believe that the LandSat and the

SeaSat satellites as they come into existence, can be used as a very important tool. But let's face it: The imagery from those instruments is not generally available, because of money or distribution problems, or, equally important, the inability of untrained citizens -- you represent yourself as a common citizen -- to use remote imagery for the kind of information I think you are looking for.

But I think government has a responsibility here. What I would envision, particularly with this seaward expansion, is the development of a good set of comprehensive coastal charts. We already have a great deal of information which can be superimposed to make, essentially, an atlas of our ocean and coastal resources. The atlas should show the location of resources in terms of their potential, their spatial relationship to each other, and existing facilities, with provision for updating to identify where there are new licenses, permits, and leases pending so that Joe Citizen knows where these activities are. In other words, some kind of a reasonable bookkeeping system for the basic, fundamental government information that we have not converted to hard copy and that can be used for planning, public participation, or educational purposes. I think that would be more important than merely the imagery which these satellites provide us.

UNIDENTIFIED SPEAKER: I would like to have the panel reconsider the subject of planning. Jim Curlin made a good plea for planning, and yet Bud Walsh is skeptical. I can understand that, because if you develop a plan that is too rigid, you are in a pattern which prevents progress. But if we lay out the goals and objectives for the plan, would you then, Bud, go along with that, if these could be clarified to the point where an overall plan might really be possible?

WALSH: I am skeptical of the government putting together a relatively complex plan that then becomes what we all march to.

I believe that over a period of time a lot of seemingly unrelated decisions, if they are well made, will develop into a pattern for a plan. At the same time I recognize the need to have goals. I suppose government goals are much more diffuse than they are in business, and that is because they are so different. You can't be quite as rigid in trying to achieve social goals that keep evolving and changing.

If we had had a national energy plan back in 1970, I wonder what would have happened if it had been a rigid plan and the Arab embargo came along. The danger is in losing flexibility. I guess you try to find a balance between setting goals and objectives that perhaps are vague, but generally agreed upon, with which we can head in the same direction.

Unlike Jim, I am skeptical of setting forth clear and complete plans that we then follow.

MEEKER: But any plan would have to be subject to continuing review and revision. Otherwise, what you say is quite true.

CURLIN: I don't think we are that far apart. The reason I got into the ocean business, by the way, is because I was involved earlier in an ill-fated program called "land use." That was big on the Hill at one time, as you may recall. We ended up with a coastal zone management program instead of a comprehensive land use program, so I gravitated to coastal zone management and found myself getting wetter and wetter as the years passed.

If anyone has a healthy skepticism about planning and planners, it is myself. I have had a series of unhappy experiences with them. I don't want to be misinterpreted -- I emphasized management in my response. I consider management to be a process in which planning is an integral component.

I don't espouse a hard, fast plan where everything is defined on a chart or a map, specifying that this is where an activity is going to be. Our society doesn't function that way. I do believe we have to have a planning horizon, and we have to have the information, goals, and objectives to move in a direction. That is about the extent of the planning I want. I also want an information base, and it must be the kind of information base that planners require. But I don't think we are that far apart; I don't think I am in disagreement with you.

AHERN: I am trying to do a plan for the State of California with maps on where people should go and not go, put power plants and not put power plants, and things like that. However, I share Jim Curlin's trepidations about the process.

Perhaps the reason the discussion of policy alternatives is at this abstract level is that when we went through the cases, problems didn't jump out, except for some complaining about cumbersome processes. But what I learned, and what I want to ask the panel about, is: If the state and the industry and the environmental groups all want something, let's say, like LOOP or perhaps a manganese nodule processing plant in Hawaii, for that, by George, you can get yourself a nice piece of federal legislation and go do it. It takes a little while; all the different agencies are there, but the Coast Guard can deliver the permit application to the other agencies and tell them to bring it back in so many days.

On the other hand, with Georges Bank and SOHIO, it is clear that if there are state/federal politics involved and there is no agreement, particularly among high state and federal officials, about what ought to happen with that development, that thing is not probably going to proceed at any kind of pace, and can get stymied and perhaps not even happen at all.

So I haven't really seen problems leap out. I didn't sense any members of the public complaining that they weren't able to participate in the processes in these cases, because apparently they were.

KEIL: I would like to make a few observations as a result of having sat through the discussions that we had on all the cases. The first relates to expediting the decision process, and I want to make sure that

you don't misinterpret that as railroading. One example that was mentioned was the interagency task groups on a state level. If you have too many people to go to and you don't know who they are, one task group that would pull it together would certainly help. On the federal level, it has become quite clear that it is helpful if you can assign a lead-agency responsibility.

Another point that was mentioned, again with respect to expediting, and this might apply particularly to the state level: If there is a difficult case, it is extremely important that the higher echelons get involved and become aware as early as possible that this thing is happening. Just as we talk about citizens who would like to get involved early, we should also get the necessary people in the government involved early.

Where is public participation particularly important in the decision-making process? I think every case came up with the conclusion the sooner the better, the earlier the better. If the public has a part in arguing the case before it is proposed -- and there are difficulties in doing that, as we heard -- they become part of trying to find a solution. Early participation, I think, is really improving the efficiency of the process.

With respect to the steps toward an informed public, we have had a number of discussions of mechanisms. It is important, though, that the public feels that they are participating, and it is not a matter of just putting ads in the paper or sending booklets out. You have to create the desire to become informed.

There are some things which we have not covered very well in the Forum, and one that I think is worth mentioning is that somehow I think we have to become aware of what it really costs us as a nation if the decision process gets awfully long. We must be concerned about what the cost is, no matter what the various ways of looking at costs are. Long delays mean something; first of all, the cost of not doing it. The investment is made and the money sits there. The cost of nuclear power plants has escalated by a tremendous amount, and someone has to pay for it. It is the public who ends up paying it. I think there must be an awareness created of what that cost is. That is also part of public education.

We also must compare the cost of different options for achieving an objective. I think the cases were not designed to deal with that.

This is my first Academy Forum. I find it exciting. This way of using a group of experts as a resource panel in discussions is much more effective than having a group of experts lecture to the group with no time left to ask questions and exchange ideas. The Forum, I think, has been extremely successful and productive as far as I personally am concerned. I learned not only a lot about the various projects that were discussed, but about the whole process of public participation, about the broader dimensions of decision-making and government interaction.

It also verified something that I have been arguing for many years and that Russ O'Neill expressed here: That engineering in today's

environment means much more than just being concerned with making something that is technically correct and functioning. Engineering means working toward solutions, and the solutions must certainly meet the technical constraints and be valid and operative. But they must also be workable within societal constraints, and we have to learn to do that. It is a somewhat painful enterprise. It is not just a matter of meeting regulations.

I think there is a responsibility also to show the opportunities that technology could offer if certain regulations were changed. That is not generally being done. But I believe it is important -- if you really want to make progress -- to look at the technical options which may appear feasible. And if they are really worthwhile, I think we should put them forward, and see whether the regulations can't be changed to open up new opportunities.

There were some comments made about port industrial complexes and the difficulty of getting tbem approved. They are the style of operation in quite a number of countries. They are actually an example of intense land use, freeing other land for other purposes. One shouldn't rule against those things out of hand without really doing studies and evaluating such alternatives.

It is a challenge to the engineering community to find technical solutions that are more effective in every respect: energy use, environmental protection, technical efficiency, and meeting the societal constraints. It requires acceptance of the fact that we have to think in somewhat broader terms with our technical solutions. That I have been arguing, and I think I heard it, in essence, throughout the discussion of the cases.

COMMENTARY

Alfred A. H. Keil
Co-Chairman

The objective of this Forum was to explore the role that the process of citizen participation plays in new seaward development in the United States.

The term "seaward development" covers the development of ocean uses and related activities in the coastal zone. The major thrust for seaward development involves both the expansion of present ocean uses and the initiation of new uses in order to derive economic and social benefits. The resulting "ocean-use industries" carry out these developments and operations (including, for example, marine transportation, ocean mining, offshore oil and gas production, and dredging and the disposal of dredged material at sea). In addition, public utilities use the coastal waters as cooling water for shore-based power plants, and municipal sewage treatment plants discharge into coastal waters. Federal, state, and local governments regulate uses of the ocean in the public interest by controlling renewable and nonrenewable resources and the "pollution" generated by ocean and shore-based operations.

Economic benefits from seaward development are usually interpreted too narrowly as meaning profits for individual industries. Important as such profits are (industry cannot survive without them), the economic benefits to be gained by the nation as a whole can be far greater. Opportunities for future seaward developments are therefore not only industrial options but national options, and they may even be national requirements in the face of international competition. The importance to the United States of ocean uses must be understood and taken into account.

Much has been written about the dependence of the United States, its industries, and its economy on the uses of the oceans, both present and potential. Seaward development in the United States, however, continues to suffer from lack of public awareness of the importance of ocean

resources for the nation. The general public seems remarkably unaware that the era of independence enabled by U. S. land based mineral and oil resources has passed, and that many ores and much of the crude oil critical for U. S. industry and public use have to be imported. The public does not seem to realize the significance of marine-transportation-based exports and imports for the U. S. economy. Nor does it realize and appreciate the rapidly increasing rate and sophistication of ocean activities and technology in Japan, Norway, Great Britain, the Federal Republic of Germany, and France, which indicate not only the commitment by these countries to expand ocean uses, but their determination in pursuit of clearly defined national goals. In fact, many of our approaches to new ocean uses are based on or hampered by historical concepts going back to the eighteenth and nineteenth centuries.

Up to ten years ago, the decision-making process for seaward development involved only industry and the government. Since then public participation has been mandated, and the process now involves three groups. The term "public participation" does not refer to government representation of the public interest or the indirect participation in corporate decision-making by stockholders. It refers to direct participation of citizen groups, each representing a set of special, common interests, or of their designated spokesmen. Citizen participation results from a concern that certain aspirations, particularly with respect to the quality of life, will be affected in a detrimental way by new seaward development plans. The major objectives of public participation, with respect to ongoing or projected ocean activities, have been the protection of the ocean environment and coastal zone from pollution, the protection of marine life, the preservation of wetlands, and the establishment of sanctuaries.

Industrial decision-making is by necessity concerned with technical and economic dimensions and its commitments for massive amounts of capital require a reasonable degree of confidence. The decision-making by government, and particularly by citizen groups, is primarily political and inherently unpredictable. Herein lies a key dilemma for industry in its own decision-making process on the potential development of ocean uses. This process is further complicated by the fact that none of the three groups speaks with a single voice; each group in itself is fragmented.

As a consequence, seaward developments in the United States have slowed down during the past decade, and concern is growing that the United States is losing ground both internationally and domestically in this area, as well as in related ocean technology developments.

The four case studies discussed in the Forum have indicated that participation in the decision-making process on seaward developments has often started with polarizations, with each party looking at the other's weaknesses but not its own. Bud Walsh described the consequences in the lucid observation that this generates at the most "narrow victories which are not good in the long run," and that "a morass of fighting fiefdoms makes no decisions that are timely, fair, or balanced." On the

other hand, Leonard Meeker pointed out that public participation can not only be highly educational to the public, but can make significant contributions if the decision-making process systematically addresses the problems, the facts, the choices, the consequences of actions (and inactions), and the "rational solutions" for accommodating a spectrum of sometimes contradictory values.

The Forum, recognizing the value of the effective citizen participation mandated by the federal government, focused on steps to make the decision process in seaward development more effective and less time consuming.

The discussions of the four cases and the Forum's general proceedings have illustrated the complexity and intricacies of seaward development projects, the resulting complications in the process of public participation, and the need for developing ocean resources in the context of national and international interests. It is, therefore, no surprise that during the Forum the need for better education of the public was stressed to ensure effective public participation in an area so complex as ocean affairs. This call for a more informed public should apply not only to the public participation group, but to the U. S. citizenry in general and to industrial and governmental decision makers, the legal profession, and the courts.

The understanding of several background characteristics of seaward development is essential to a better informed public. Because these points were only touched on during the Forum, they are given fuller development here, as part of the broad perspective needed for more effective participation in the decision-making process.

Important seaward developments since World War II

In the last thirty years, ocean uses have been modernized in ways that, taken as a whole, seem almost revolutionary. Some examples follow:

- The transport of passengers between continents before World War II was solely by means of passenger ships. Since the 1960's it has been, for practical purposes, overwhelmingly by aircraft.

- Most of the ocean transport of industrial products has been shifted from general freighters to specialized ships (containerships, barge-carrying ships, and the roll on/roll off ships). This change required substantial reorientation of port operations to assure rapid "throughflow" of the cargo at the ports.

- Since World War II, exploration for and production of offshore oil and gas in large-scale industrial operations has evolved worldwide, coupled with developments of special drilling and production platforms that successfully operate in water depths of up to several thousand feet. About 19 percent of the world supply of oil now comes from offshore platforms.

- The increasing demand for industrial raw materials, fuel, and food products has led to the development of special super ships, including oil tankers of 300,000 tons and more, and large bulk carriers, with associated special loading and unloading facilities.

- The rapid growth in worldwide fish catches during the post-World War II years is due only to a small extent to the improvement of existing fisheries; primarily it is the result of large-scale coordinated fishing operations (at-sea fish catching and processing systems), which are actually big industrial operations. Coupled with this development of fishing industries is the advancement of fish processing and preservation techniques.

- The increased automation of shipboard operations and the development of specialized port facilities in connection with specialized classes of ships has led to drastic changes in the required work force.

The growth of ocean engineering capabilities in seaward development

There have been meteoric advances in ocean engineering capabilities and technology, coupled to their use in seaward developments.

Most of the dramatic seaward developments during the past three decades are the result of the expanding of existing branches of ocean technology to accommodate the development of larger and more specialized ships. This development was sparked by the need for greater economy in marine transportation. It required expansion of the underlying principles of ship design and operation as well as the evolution of the related technology, which could be developed only through operating experience.

The offshore oil and gas developments during the past three decades required the development of new technology and engineering capabilities for offshore exploratory drilling and related safety measures, drilling and production platforms, and the laying of pipelines. The rapid development of these capabilities during the past thirty-five years is rich in creative, innovative engineering.

Pioneering efforts of the emergent offshore mining industry required the development of a deepsea mining capability, which includes mining the nodules on the ocean floor; separating the tailings from the nodules, either on the sea floor or at the ocean surface; transporting the mined products to the surface; transferring the manganese nodules from the floating mining facility to ships; transporting them to a port; transshipping them to a special smelting facility; and extracting the critical metals. All these steps require adaptation of existing ocean technologies and coupling them with new developments (such as deepsea mining technology) in an economically viable manner. This necessitates an evolutionary process of designing, building, testing, and evaluating

in order to gain the experience and capability necessary for a successful future operation.

In addition to providing the necessary operation and engineering capability, the design of these new techniques must assure reliable and safe operation and "acceptable" degrees of protection of the environment.

Another important dimension of these ocean technologies is their economic value, which goes beyond their value to the specific operation for which they are developed; advanced engineering services have a high premium on the international market because they are sought by many countries who decide to develop ocean uses.

The major impact of the advancing ocean technology and engineering capability has manifest itself when there has been distinct effort to consider all facets of a specific ocean use or resource development in the framework of an integrated systems approach. Striking examples are the high sea fishing fleets of Japan and the Soviet Union, the U. S. offshore oil and gas industries, and the development of container shipping.

Foreseeable seaward developments

Part of the public's education about ocean development should be a broad knowledge of the probable areas in which this will take place. A few examples follow of the kinds of seaward developments projected over the next fifty years, to indicate the dramatic changes likely to occur.

- The increasing uncertainty about public acceptance of nuclear power, coupled with the certainty of a decline in the availability of crude oil and natural gas, is causing world attention to shift to coal as an energy supply by the turn of the century. Projections have been made that by the year 2000 transocean shipments of more than a billion tons of coal may be needed. Major potential suppliers for this amount of coal are the United States, the Soviet Union, India, Australia, and South Africa. The establishment of the necessary mining capability and of the transportation networks to move the coal, both to ports for transshipment to other continents and to the inland users, will require lead time of decades and an integrated, worldwide approach.

- As we have seen in the Forum, a large-scale manganese nodule mining industry is projected for taking advantage of the vast fields of manganese nodules on the ocean bottom to obtain copper, cobalt, manganese, and nickel, which are critical for most industrial developments. This requires the development of an ocean-mining industry and the transshipment to port facilities where the nodules will be processed. It illustrates how development of new offshore resources must be closely coupled with coastal zone use and coastal zone development.

- While many of the specific fish resources in high demand on the world market are overfished, there are other, underutilized fish resources of enormous magnitude available in the oceans and the polar regions. Innovative steps are required not only for harvesting and processing these resources, but also for marketing them.

- Offshore oil and gas resources in frontier areas of the continental shelf, the polar regions, and possibly the continental margins are likely targets for development and will require innovative approaches and advances in technology.

- The world's food problems will necessitate a new look at grain storage and transshipment capabilities to overcome the frequent breakdown in international grain shipments.

The Forum on Seaward Development proved to be a valuable experience for all participants, as some of the intense exchanges have indicated. It brought out the fact that seaward developments have many dimensions that make them much more complex than land-based developments: state, national and international "ownership" and overlapping jurisdictions; the debate on government's vs. industry's role; interrelatedness of various activities as a result of the fluid nature of water; and the difficulty of achieving a consensus on national goals and needs. The decision-making process in seaward development, involving government, industry, and public participation, requires appreciation of the scope of the problems in order to be effective. It must also take into account the local nature and impact of technology and industrial developments in the context of national interest and international competition. Furthermore, this decision process must make allowance for those physical, social, and environmental phenomena that by nature turn out (even with the best efforts) to have unpredictable outcomes.

To find a way for reaching decisions on seaward development, in spite of all these complications and risks and in a wise and considered manner, is the challenge facing the nation. To develop a better informed citizenry is the crucial first step in meeting this challenge.